Textile World
MARCH, 1958
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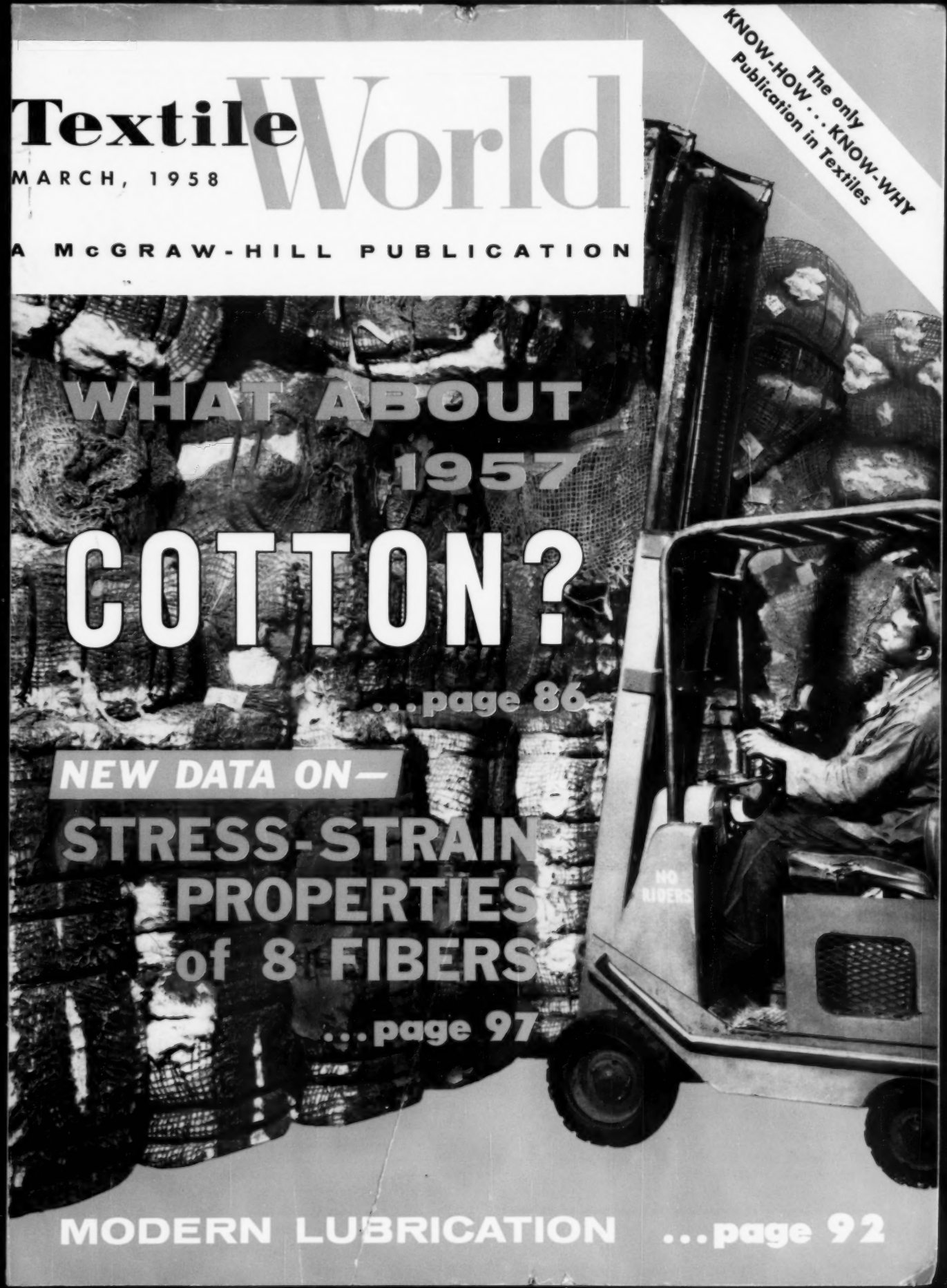


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AT THE SPRINGS COTTON MILLS

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TEXTILE BUSINESS

Textile World

MARCH • 1958

THIS MONTH'S HIGHLIGHTS

The Union Faces Facts
•
Newer Fibers Feel Pinch
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Cotton Gray Goods Stymied
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Import Woes Increase
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Tax Reductions This Year?
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Hosiery Giants Talk Merger
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European Common Market
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For Better Sales: Sell Color
•
Show Spurs Retail Sales

# The Union Faces Facts

**It looks like a year of labor peace for Northern cotton, rayon, and wool mills.**

The TWUA-CIO decided last month not to ask for any general wage or fringe-benefit increases for its 50,000 members in New England and the Middle Atlantic states.

And the mills, for the most part, are agreeable to extending contracts for another year with no changes.

Contracts run out between April 15 and May 1 and cover 30,000 workers in about 100 cotton and rayon mills and 20,000 workers in another 100 woolen and worsted mills.

**The decisions are important not only to the textile industry, but could provide a clue to much wage bargaining in general this year.**

For several years now, Northern mills have been fighting a recession of the type that just recently has begun to affect the general economy. And TWUA, like other major labor unions, has been having trouble just holding its own.

•

**The decision on Northern mills did not come easily, and it was reported to have passed by about a three-to-two margin after a hot debate.**

Biggest objectors were a group of 15,000 workers in so-called specialized cotton and rayon mills whose wages are about 30¢ to 40¢ an hour higher than in basic cotton, rayon, and wool mills.

This group may seek some increases, but members feel their chances have been stymied by announced TWUA policy. And present conditions lend support to any management seeking to oppose union demands for higher wages.

Actually TWUA had little choice in deciding its course.

Last year it gained only small increases in fringe benefits, and it lost in arbitration a demand for higher wages made on Bates Mfg. Co.

•

**Conditions now aren't as good as a year ago.** Berkshire-Hathaway, with some 9,000 workers, is NewEngland's biggest textile employer; and the company is looked upon as the pace setter in labor settlements.

But it lost $1.4-million for its first fiscal quarter on sales that were about 20% less than in the same quarter a year ago. Loss for the whole fiscal 1957 was over $3-million.

And Bates, another major employer, has narrowed its operations to three mills in the last year in an effort to get its operations onto a profitable level.

If the status quo is maintained, as now expected, Northern cotton and rayon mills will continue to pay average wages of $1.40 an hour, plus another 15¢ an hour in fringe benefits. Woolen and worsted mills average about $1.62 an hour. Both rates are from 10¢ to 20¢ an hour higher than rates in Southern mills.

# Newer Fibers Feel Pinch Of Mill Curtailments

**A sudden, sharp buying cutback by mills has caught up with the pace-setting man-made fibers like nylon, Dacron, and glass.**

Off to a flying start since they came on the market, these fibers have racked up spectacular gains.

But last month the general business slide dragged some of the newer man-made fibers down with it, and fiber producers acted quickly to bring production into line with reduced demand.

Du Pont and Chemstrand, the nation's two leading producers of nylon, have reduced the work force at their Southern nylon-producing plants by 8%; and a further cut by Du Pont was scheduled for last month.

Du Pont has also cut down on Dacron production, and Owens-Corning Fiberglas Corp., leading producer of glass fiber, points out that its facilities have been operating at substantially below capacity.

●

**For some time now the newer man-made fibers have been the strong prop under production figures.**

Last year, for example, a decline of 8.5-million lbs. in rayon and acetate production, as compared to 1956, was more than offset by an increase of 128-million lbs. in newer fiber output.

Yarn producers point out that a weak textile market is being temporarily aggravated by intense inventory-trimming and hand-to-mouth buying among mills.

Weavers of glass fabrics, for example, have cut their inventories to only one-third of what they were a year ago. As one yarn producer put it last month, "Our customers are living off the back of our delivery trucks."

The newer man-made fibers are by no means alone when it comes to production cutbacks; but when fast runners like nylon and Dacron falter, the extent of curtailed business activity is pointed up further.

**For nylon, the cutbacks stem from several causes.**

Last fall mills went on a buying spree to beat a rumored price rise in nylon. But when the price did not go up, they pulled in their horns and began living off stocks.

And demand for nylon tire cord has slipped ever since bad news on auto production started coming from Detroit. Both knitters and weavers have tapered off their immediate needs for nylon.

●

**Observers view the cutbacks as temporary,** and most producers look for renewed activity this month or next. All growth industries pause for breathers from time to time, and fiber producers are going ahead with expansion plans.

Nylon capacity is being increased. Owens-Corning has just boosted capacity for Fiberglas production by 50% and has budgeted a good sales increase for 1958. Pittsburgh Plate Glass

### Auto-Fabric Use Off As Car Production Slides

**Automotive-fabric consumption is running behind a year ago.**

Passenger-car production fell to 489,357 units in January, 8.5% under the 534,722 cars built in December and 23.7% under the 641,436 cars assembled in January, 1957.

Output for the month was the lowest January production by the industry since 1954, when auto makers built 456,766 cars.

And new-car sales in January plummeted to the lowest daily rate in four years.

●

Sharpest drop in fabric consumption was at Chrysler, with the De Soto Division the farthest behind so far this year.

Chevrolet was the only division of General Motors to produce more cars in January than in January a year ago.

And American Motors was the only car maker to report a gain over December and January, 1957.

**Lower demand for most automotive fabrics has begun to unsettle some prices.**

Wide drill for plastic coating, for example, is ½¢ a yd. under list price; and some fabrics are carrying discounts up to 1¢ a yd. under list.

### Boom in Children's Clothing

**Knitting mills making infants' and children's clothing are in an optimistic mood.**

Statistically, their market should be good through this year. There were 4.7-million babies born in 1957, and latest statistics indicate about 5-million births in 1958.

A leading knitting mill, William Carter Co., is expanding production facilities in anticipation of increased demand for new styles in infants' and children's clothing.

Last year Carter boosted its sales 7% over 1956.

plans to build a new plant to make glass fiber with a potential output of 25-million lbs. a year.

**The long-range view for the newer man-made fibers is filled with nothing but optimism in spite of last month's setback.** New acrylic fibers like American Cyanamid's Creslan, Dow Chemical's Zefran, and Goodrich Chemical's Darvan are being readied for the market.

And there is hardly a producer of man-made fibers who isn't working on plans to nibble away continuously at the market for natural fibers.

# Cotton Gray Goods Stymied

**The unfavorable trend in prices for cotton gray goods persisted in hanging on last month.**

And it's mostly inventory imbalances at the mill that have been keeping cloth prices so low for so long while cotton prices continue to edge up.

In spite of big production cutbacks, the ratio of mill stocks to unfilled orders has remained well above the postwar average.

Large yardages of cotton gray goods continue to move into marketing channels, but buyers know they can get all the cloth they want at any time.

**So it's going to take a lot more reduction of inventory before prices will strengthen.**

Already mill consumption of cotton has tapered off to the lowest level since 1939. And with further production cutbacks, mills will be keeping cotton consumption at low levels for several more months.

Total mill use for the cotton season is now indicated at about 8-million bales, for the smallest consumption since the 7.8 million bales used in 1948–49.

•

**Last month market-indicator 80-square print cloth drifted down to 17½¢ a yd.**, the same price it sold for in 1949 and only a fraction better than the postwar low of 17¼¢ established last November.

Late last year the market showed signs of improving when the 80-squares engaged in a brief upward spurt to 17¾¢ a yd. But then inventories and the general economic recession subjected cloth prices to added pressures.

The final OPA price after World War II was 19.67¢ a yd. for 80-squares. Then prices boomed to 38½¢ in early 1948, slipped to 17½¢ in 1949, and climbed again to 29¢ in 1951.

Since that time 80-square prices have been in a steady nosedive.

**No mill is doing very well at current prices.**

Mill margins in January for the 80-squares dropped to 27.95, as against 31.80 a year ago. The average margin for six print cloths in January was down to 28.44, compared to 32.19 a year ago; while the average margin on 17 gray-cloth constructions stood at 25.26 in January, as against 29.19 last year.

### Burlington Profit Rises In First Fiscal Quarter

**Burlington Industries had a net gain in profits for the quarter ended December 28, 1957, first quarter of its fiscal year.**

But sales dropped to $170-million for the quarter, compared to $177-million in the same period a year ago.

December-quarter profits rose to $4-million, or 44¢ a share, from $3.8-million, or 41¢ a share, in the same period in 1956.

•

**Burlington's profit gain is its third successive quarterly earnings increase.**

Improvement is attributed to diversification. And stable prices in man-made-fiber fabrics are believed in particular to have aided the profit picture.

But Burlington is discouraged by current price levels. As Spencer Love, board chairman and president, put it last month, "Current textile prices are so near rock bottom that if changes occur, it seems reasonable to assume the changes will be in only one direction—up."

### First Acrylic Fiber in U.K.

**LONDON**—Courtaulds Ltd. plans large-scale production of Britain's first acrylic fiber, Courtelle, in a new plant at Grimsby.

Commercial production on a medium scale is now taking place at the company's rayon plant at Coventry.

### Mill Failures Off

Four textile mills failed in January with liabilities of $275,000, compared to 10 failures in January a year ago with aggregate liabilities of $1.1-million, according to Dun & Bradstreet.

### Bright Future for Nonwovens

A bright future for nonwoven fabrics was painted last month at a forum of the Textile Section of the New York Board of Trade.

Production and sales volume of the nonwovens are expected to double in the next three years.

S. I. Rudo, Werner Textile Consultants, predicts that production of nonwoven fabrics will go from present volume of 90-million lbs. annually to 200-million lbs. annually in 1960.

•

Increases by end-use groups in 1960 are visualized as follows: industrial fabrics, from 55-million lbs. to 85-million lbs.; home furnishings, including sanitary textiles, from 20-million lbs. to 55-million lbs.; apparel uses, from 15-million lbs. to 60-million lbs.

### Country of Origin Poses Textile Import Problem

LONDON—Britain's textile industry is busy trying to lick an import problem that is becoming increasingly difficult for many countries under expanded world trade.

The proper definition of "origin" of yarn, cloth, and made-up garments forms the crux of the problem.

The British say a definition must be found for two reasons—

• Before a European free-trade area is established, Britain must ensure that only goods that "properly originate" in participating countries enter the U. K. duty free.

• Although Britain has enforced antidumping measures and quota restrictions on some foreign textile imports, the industry believes there are loopholes through which "unscrupulous exports" can send goods to Britain over and above their quotas.

•

When the Board of Trade recently imposed quota restrictions on textiles from Communist China, industry leaders pointed out that China could ship goods to Hong Kong for re-export to Britain. (Because Hong

# Import Woes Increase

**Growing problems of textile imports were bothering a wide group of mills last month.**

Far from being settled, import troubles are increasing; and additional pressure is being put on Washington for various forms of relief.

Quotas for 1958 on Japanese cotton fabrics have not been settled yet; and wool mills are still waiting for a ruling on this year's operation of the Geneva Reservation, which raises duties from 25% to 45% when wool-fabric imports reach 5% of domestic production.

**And here's what's been happening to two other branches of textiles—**

• Carpet and rug mills applied last month to the U.S. Tariff Commission for relief from a rising flood of foreign-made carpets.
• Imports of silk fabrics are setting new records, and silk weavers are contemplating measures to stem the tide.

●

**Carpet and rug mills want the duty on wilton and velvet carpets increased from the present 22½% to 40% ad valorem** as soon as imports rise above 5% of U.S. production per year.

Their proposal is similar to the plan now covering wool-fabric imports; so carpet manufacturers are hopeful of sympathetic treatment.

Carpet imports have expanded rapidly in the past 10 years.

In 1948, imports of wiltons, velvets, and similar rugs were 1.8% of U.S. production. By 1955 the ratio had climbed to 10.9%, and last year imports represented 11.2% of U.S. output.

While imports were rising, carpet-mill earnings were slipping. Average annual profits in relation to sales decreased from 7.03% in the 1947–50 period to 2.12% in the 1954–56 period.

And carpet mills know that foreign competition is bound to increase.

●

**Now that silk-fabric imports are zooming to all-time highs,** it is certain that U.S. weavers will seek some form of relief in the very near future.

**Imports of silk fabric jumped 48% last year over 1956, and raw silk used by U.S. mills slipped 25%.**

Japan shipped a record 44-million sq. yds. of silk fabrics to the U.S. in 1957, as against 27-million sq. yds. in 1956. The previous high was set in 1950 with 40-million sq. yds.

And last December's imports shot up to 7.5-million sq. yds., almost twice the monthly 1957 average.

**And while wool mills were waiting last month for Washington to settle the Geneva reservation for 1958,** wool-fabric imports are pouring into the U.S. under the lower 25% duty.

In the first few weeks of business this year, about one-fifth of the 14-million-lb. quota had entered the country.

**And a big hike in Japanese wool-fabric imports is adding to U.S. mills' woes.**

Japan's share of the U.S. market on certain fabric weights has increased substantially while Britain has dropped off. Japan now has almost twice as many woolen and worsted looms as the U.S., and the trend in imports has ruffled U.S. wool-fabric manufacturers.

Big wool-fabric producers like J. P. Stevens are particularly alarmed by Japanese imports, and the company is rallying support to lick the problem.

Kong is a British colony, there are no restrictions on its exports to Britain.)

The Manchester Chamber of Commerce put forward what it considered the best definition to be adopted: A country of origin is one in which textiles and made-up garments are spun, woven, and finished.

# Tax Reductions— Will They Come This Year?

**Tax reduction as a business-stimulant measure is gathering momentum.**

Congressional sentiment for lower taxes is mounting, and last month President Eisenhower said tax reductions might be necessary if business doesn't pick up in coming months.

Already a stand-by bill has been introduced in Congress that looks toward a possible $2.5-billion tax cut.

Passage for the bill will not be sought right now, but the bill is available; so action could come quickly if business continues to slide.

**Mill men would like to see taxes reduced** because they believe the move would—

- Stimulate consumer buying
- Release the barriers to saving and thereby increase the supply of venture capital and get the economy back on the road to substantial growth

•

**Right now textile money experts say there is a fifty-fifty chance that we may get tax reductions this year.**

Some observers believe that Congress may come to accept the theory that our present tax-rate structure is harmful and that lower rates would actually produce larger revenues for the treasury than if rates were not cut.

But the big question is what kind of reduction might develop.

One possibility includes reforming the entire income-tax rate structure, both personal and corporate.

Proposals have been made to the Ways and Means Committee that would result in a new top rate of 42% for both the personal and corporate tax at the end of a five-year period.

**But there's general agreement that any decision will be held off until late spring.**

By that time it will be possible to get a closer look at the business trend, and 1957 income-tax receipts will be known.

### Southern Weaving Expands

**Southern Weaving Co., Greenville, S. C., has bought Anderson Narrow Fabrics, Inc., and Narrow Fabrics Finishing Co.**, both in Anderson, S. C., for an undisclosed price.

The two plants will operate as wholly owned subsidiaries. They add 44 narrow looms, 34 webbing looms, and 44 tape looms to Southern Weaving's capacity.

### Hosiery Shipments Off

**Total shipments of hosiery dropped a fractional percentage last year,** with 146.5-million doz. pairs delivered by mills compared with 147.3-million doz. pairs in 1956.

A strong second half wiped out the effects of a disappointing trend in the first half of 1957; and if the general business economy had not faltered in the closing months of last year, shipments would have topped 1956 levels.

•

**Shipments of women's seamless nylons shot ahead 30%,** climbing from 13.6-million doz. pairs in 1956 to 17.6-million doz. pairs in 1957.

But full-fashioned nylons continued to slip, going from 43.8-million doz. pairs in 1956 to 39.9-million doz. pairs last year.

Shipments of men's hose were off 4% from 1956, while the total of children's and infants' types registered a 5% increase.

# Merger Will Create A Hosiery Giant

**Two of the nation's biggest hosiery producers were talking merger last month.**

If Julius Kayser Co. and Chester H. Roth get together, as expected, the combined firm will become one of the largest hosiery and knit goods manufacturers in the country, ranking with such giants as Burlington, Hanes, and Berkshire.

Roth stockholders approved the merger last month, and Kayser stockholders are slated to vote their approval next month. If there is no hitch, the new company, to be known as Kayser-Roth Corp., should be ready for business in August.

●

**Combined sales should top $100-million.**

Kayser reported sales of $65-million for its fiscal year ended June 30. Roth is a privately owned company and does not report financial results, but its annual sales are known to top $40-million.

Prior to announcement of the merger plans, Kayser stock climbed from 9¾ to around 15 in a few week's time. High for Kayser last year was 16.

Kayser sold its Diamond Hosiery division to Danite Hosiery last October, and since then Kayser has been the frequent subject of merger reports.

●

**Roth now has over 15% of Kayser stock, amounting to 126,605 of the 747,498 common shares outstanding.**

Some of these shares were purchased from List Industries and wiped out List's interest in Kayser.

Abraham Feinberg, president of Kayser, is an officer and principal stockholder of Hamilton Textile Mills, which owns 28% of Kayser's stock.

**So Roth and Feinberg control almost 44% of the outstanding Kayser stock.**

Kayser had a profit of $627,536, or 84¢ a share, in fiscal 1957. In the quarter ended Sept. 30, Kayser reported earnings of $64,764, or 8¢ a share, compared to a loss of $173,243 in the same period a year ago.

●

**Kayser-Roth will continue to operate all business now being run by both companies in the U. S. and Canada,** including Kayser's Luxite-Kayser and Holeproof brand women's stockings, Catalina bathing suits, and Nazareth infants' and children's underwear.

Roth makes Esquire brand men's socks, Mojud women's stockings under license from Mojud Co., and women's unbranded hosiery.

### Dan River Lifts Sales, Profits

**Another big mill has racked up a sharp 1957 sales increase but only a small gain in profits.**

Dan River Mills had sales last year of $164-million, a jump of 34% over the $122-million recorded in 1956.

But earnings rose only about 6%, to $5.6-million from $5.3-million in the previous year.

**Most of Dan River's sales gain came from operations of Woodside Mills, Alabama Mills, and Iselin-Jefferson,** which were acquired in August, 1956.

Operations of these companies were included for all 1957.

### Knitted Shirts and Bulkies Continue in Good Demand

**Knitted shirts and bulky-knit sweaters continued as hot items in last month's market.**

Shetland-wool sweaters were also strong. Textured-filament yarn, already pushing ahead in women's knitted garments, is making headway in men's wear.

Red, black, white, gray, and heather shades are leading the color race for next fall.

### Denim Prices Unchanged

**Denim prices have been reaffirmed for delivery in the second quarter.**

Price basis is 37½¢ for the 10-oz., Sanforized, indigo, and 39½¢ for vat dyed.

Mills report that denim shipments have been maintained at satisfactory levels, but increased activity is expected soon if usual buying patterns hold.

# European Common Market Not Too Good for Textiles

**Textile men were taking a closer look last month at the infant European Common Market** now that this six-nation trade group is official.

What they saw was a complicated long-range pattern, and very little of it looked good for U. S. textiles.

The countries that joined together in January to create a market free of tariff and other trade barriers are France, Germany, Italy, Belgium, Luxembourg, and Holland. And a common tariff will be set against other countries.

The common market and the free-trade-area scheme mean that about half the world's trade will come within the scope of institutions to which the U.S. does not belong and according to rules that the U.S. has had little part in shaping.

There will be gradual elimination of tariffs and quotas on trade among member countries over a 12- to 15-year period, but experts were predicting last month that the program stands a good chance of complete integration in shorter time.

•

**Biggest market for U.S. textiles in the six European countries involved is in man-made-fiber-fabric specialties.** Last year over 8-million yds. were shipped, with Germany and Belgium taking about 3-million yds. each and Holland about 2-million yds. France, Luxembourg, and Italy took small amounts.

Cotton-fabric exports to these countries are small. Germany took less than 2-million yds. last year and Holland about 1.5-million yds. Very small yardages were imported by the others.

**Right now U. S. mills hold a big advantage in being able to produce for mass markets.**

But the mass-market idea is one of the aims of a common market.

Economic integration will promote Europe's industrial efficiency, including textiles, in the same way that the free movement of labor, raw materials, and capital developed the U.S. industrial base.

And observers agree that once textile mills in the six countries are able to gear their production to one big market, they will be able to meet most demands and have a surplus for export.

**In a few years the European manufacturer will be able to compete on the same level as the U.S. manufacturer,** and in some places the European will have definite advantages.

For example, a big free-trade area of all Western Europe is envisaged that will eventually include 240-million people—a much larger potential market than the U.S.

Some traders say the six nations' standard of living will rise so fast that there will be a big increase in over-all demand for goods.

But most textile men believe that if these regional trading zones succeed in mass production and if foreign wage rates remain relatively low, the U.S. will find it harder to compete in third-country markets as well as facing keener competition in its home markets.

### "Hot Cargo" Union Clauses Are Facing a Showdown

**There's progress in the battle to close the loopholes in the law against secondary boycotts.**

But it is inch-by-inch progress through tangled legal jungles.

Labor contracts with built-in secondary boycotts, popularly called "hot cargo" clauses, are facing a showdown.

Under a hot-cargo clause, an employer and a union agree that employees will not be asked to handle goods that the union discriminates against because they are made by rival unions or by nonunion workers.

•

**The resulting loss of business or jobs becomes a heavy union club.**

Not until all the loopholes are shut tight will any businessman be free of the danger of a boycott that will cut off his purchasers and suppliers.

**Two loopholes are now partly closed.**

The National Labor Relations Board has ruled out hot-cargo contracts as a defense for boycotts; and two Federal courts of appeal, as well as the board, have restricted the circumstances in which roving pickets can legally operate.

### Worsteds Still Popular

**Worsteds will continue to dominate the men's wear-fabric market this fall,** according to a retail survey made by the Clothing Manufacturers Association.

The survey also showed—

- The importance of fancies in worsteds and a decline in all-wool flannels
- Greater use of lighter-weight outercoats for fall 1958 than heretofore
- Growing popularity of blues in outercoats, with tweeds leading the fabric parade

### Armed Forces Still Hold Bulging Textile Inventories

**The Armed Forces still hold bulging inventories of textiles and clothing** in spite of efforts at reduction.

The yearly report on Federal property shows that military inventories of textiles and clothing totaled over $2.2-billion for the fiscal year ended June 30, 1957.

•

Stocks were broken down as follows: Army Quartermaster Corps, $1.9-billion; Navy, $88.1-million; Marine Corps, $34.4-million; Air Force, $157.6-million.

A recent merger of procurement agencies of different service branches into a central agency is making a reduction of inventories possible.

**Inventory reduction is now running at a planned rate of $250-million over the next 18 months.**

Further reduction may reach $500-million in the next few years.

### Housing Starts Increase— Rise Expected To Continue

**Housing got off to a good start this year.**

The pace of private-home building in January was at an annual rate of more than 1-million starts.

The rate was a little better than the average for the fourth quarter of 1957 and the highest annual rate since last August.

•

**And there is good news for mills on home-furnishings fabrics:** Economists expect the rise to continue.

Washington has consistently listed housing as one of the favorable factors indicating an early economic recovery.

And applications for FHA mortgage insurance on new homes rose 14% in January from December, and they were 64% ahead of January a year ago.

# For Better Sales: Sell Color

**Manufacturers of women's hosiery are right in the middle of a big color promotion.**

Their chief aim is to find a way to increase hosiery sales and profit margins.

So far the plan seems to be working.

Last month both manufacturers and retailers felt the color program for women's hosiery was well off the ground, and sales of colored hosiery are expected to take between 25% and 35% of total sales of full-fashioned and seamless constructions this year.

Mills had set their sights on 5% of the market for colored hosiery last year, but reports indicate they got better than 15%.

Nylon-hosiery-yarn producers like Du Pont and Chemstrand have helped the mills by backing color in women's hosiery through a variety of promotional programs.

•

**Pricing patterns based on weakness have dogged the women's hosiery market for some time now.**

Overproduction is the big headache; and certainly the introduction of shades like blue, green, and apricot will not provide all the answers.

**But color is giving the industry a good boost now that retail promotion has spurted ahead.**

And the pattern of population growth favors hosiery sales—a trend that should give colored hosiery a healthy assist.

The adult female population will increase sharply in 1958, when thousands of girls from the World War II bumper crop of babies reach the age groups that normally buy most of the hosiery.

Teenagers are most given to bare legs, and mills hope that something can be done this summer to get more of this group to wear stockings. Hosiery manufacturers feel that youngsters, being least conservative, will adopt the new hosiery colors more readily.

•

**Another good bet is the promotion of colored stockings in harmony with ready-to-wear and accessories.**

If, as the result of colored hosiery, each woman were to add one pair of stockings a year to her normal replacement buying, there would be a thumping increase in consumption of almost 5-million doz. pairs.

**Significant factor is the need for stores to maintain expanded inventories.** So far this has worked to the knitter's advantage.

But like any promotion where color is involved, no one knows just when a particular shade is going to boom or bust. Sooner or later stores must cull out the slower-moving colors at bargain prices.

Mills were hoping last month that colored hosiery will become firmly enough established at good prices to weather such eventualities.

# Miniature Textile Show Spurs Retail Sales

**By staging a miniature textile show during the traditional January white sale, a big Southern department store was able to boost its sales of textiles by 60% over the previous year.**

What started out as a routine sales-promotion plan snowballed into a textile-machinery and products exposition at Efird's Department Store in Charlotte, N. C.

The whole thing began when Henderson Belk, vice-president of Efird's, asked Pat Hall, a textile-machinery dealer, to lend him a piece of textile machinery to put in one of the store windows during the January sale.

Hall came through with a complete spinning mill from bale breaker to spinning frame. The line of equipment was too large for the store windows; so it was set up outdoors in a garden turned into a cotton patch complete with mannikin field hands.

•

**After that the store's promotion committee really got hot and asked neighboring textile manufacturers to lend product exhibits and machinery.** Among the first to respond were Roger Milliken, Charles Cannon, and Elliott Springs.

Highland Park Mfg. Co. installed a loom in the front window, and Chadbourn Gotham, Inc., contributed knitting equipment. North Carolina State College set up a testing laboratory.

Whitin Machine Works sent its newest spinning frame, and Celanese and Chemstrand installed equipment to produce man-made fibers.

As the word got around, other firms volunteered to lend machinery and exhibits. Soon all the floor space in the six-story building was filled.

And store manager G. W. Frizzell had a bull by the horns. "We had to save a little space for the merchandise," he said, "so we regretfully had to turn down dozens of other offers that kept coming in."

**By this time, the promotion had become more than a retail-store project.** The American Cotton Manufacturers Institute was helping out, the National Association of Manufacturers became interested, and Celanese sent its entire sales-promotion staff to take a look.

•

**Value of the exhibits ran into hundreds of thousands of dollars.** Just to transport, erect, and operate the machinery cost over $50,000. But the participants footed nearly all the bills.

Soon, stores in other cities were looking into the possibilities of similar promotions. A large store in Kansas City was trying to make arrangements to move the whole works there.

After catching its breath, Efird decided to hold future textile promotions along the same line but probably will confine the exhibits to products of one manufacturer or group of related manufacturers.

### Cotton Parity Rises

**Price supports for cotton continue to edge up.**

Last month the Department of Agriculture boosted the minimum support rate to 81% of parity on the 1958-59 cotton crop, compared with 78% last year.

Based on January 15 parity of 37.96¢, the minimum loan price for Low Middling ⅞-inch cotton is 30.75¢, as against 28.81¢ for the previous crop.

•

**The Secretary of Agriculture's hands are tied under existing laws** that state that price supports must rise as surpluses are whittled down.

Record exports took 7.6-million bales in the last marketing season, while the 1957 crop was 10.9-million bales, the smallest in years.

In arriving at the new support level, the U.S.D.A. used what industry leaders consider a conservative forecast of exports for the 1958 marketing year beginning August 1 and a somewhat optimistic forecast of production.

**But right now mills are more concerned with prospects of acute shortages of good-quality cotton.**

They would like to see cotton acreage increased for 1958, but Agriculture Secretary Benson says he has no power to direct such a move.

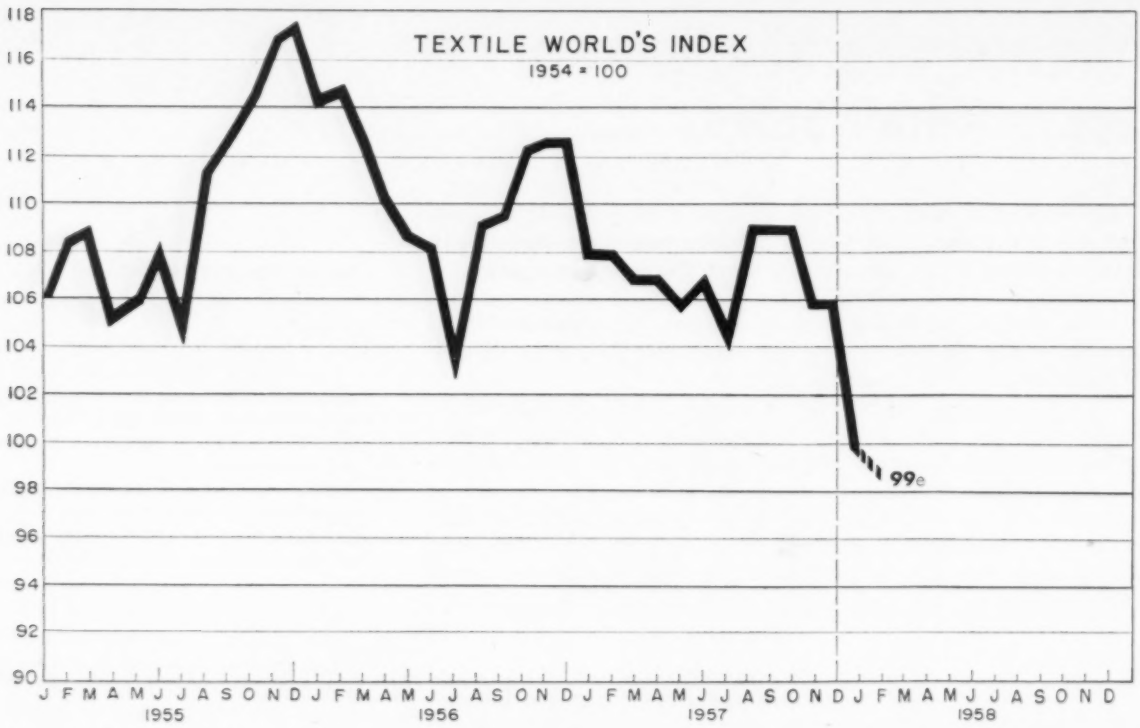
And Chairman Ellender of the Senate Agriculture Committee sees no hope that Congress will pass a bill to boost cotton acreage this year.

### Tire Cord Production Up

**Production of tire cord and tire fabric during the final quarter of 1957 was 101.7-million lbs.**

This was 2% above the previous quarter but 3% below the fourth quarter of 1956.

Output of rayon tire cord and fabric increased 3% from the previous quarter to 67.6-million lbs., while production of nylon tire cord and fabric decreased 4% to 21.6-million lbs. Output of cotton tire cord and fabric was up 24%.



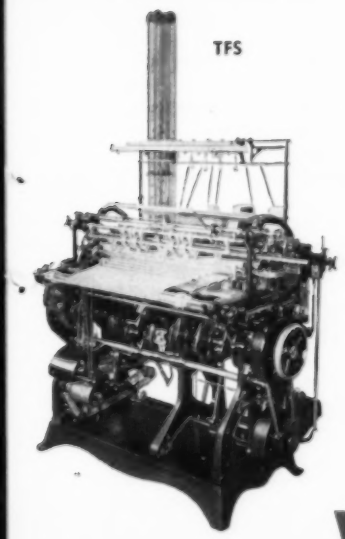

Index of manhours worked in the textile industry adjusted for changes in productivity

# Textile World's Monthly Indicators

| | Latest Month | Previous Month | Year Ago |
|---|---|---|---|
| **Textile World's Index (1954 = 100)** | **99** | **100** | **108** |
| Employment (thousands) B.L.S. | 947.4 | 975.6 | 1026.9 |
| Production Workers (thousands) B.L.S. | 856.3 | 884.1 | 934.6 |
| Weekly Earnings B.L.S. | $56.55 | $58.35 | $58.65 |
| Hourly Earnings B.L.S. | $1.50 | $1.50 | $1.50 |
| Weekly Hours Worked B.L.S. | 37.7 | 38.9 | 39.1 |
| Production Index (1947–1949 = 100) F.R.B. | 92 | 88 | 101 |
| Wholesale Price Index (1947–1949 = 100) B.L.S. | 94.6 | 94.9 | 95.8 |
| Manufacturers' Sales (million $) Commerce | 1,008 | 1,025 | 1,147 |
| Manufacturers' Inventories (million $) Commerce | 2,632 | 2,628 | 2,713 |
| Inventories to Sales Ratio | 2.61 | 2.56 | 2.33 |
| Exports (million $) Commerce | 139.3 | 130.7 | 132.8 |
| Imports (million $) Commerce | 68.1 | 82.9 | 75.0 |
| Stock Price Index (1941–43 = 10) Standard & Poor's | 19.36 | 17.30 | 23.50 |
| Failures (number) Dun and Bradstreet | 4 | 13 | 10 |

# National Economic Indicators

| | Latest Month | Previous Month | Year Ago |
|---|---|---|---|
| Industrial Production (1947–1949 = 100) F.R.B. | 133 | 136 | 146 |
| Consumer Prices (1947–1949 = 100) B.L.S. | 121.6 | 121.6 | 118.0 |
| Wholesale prices (1947–1949 = 100) B.L.S. | 118.7 | 118.5 | 116.9 |
| Population (millions) Census | 170.1 | 169.9 | 167.0 |
| Unemployment (millions) Census | 4.5 | 3.4 | 3.2 |
| Employment (millions) Census | 62.2 | 64.4 | 62.6 |
| Personal Income (billion $) Commerce | 343.6 | 343.6 | 336.3 |



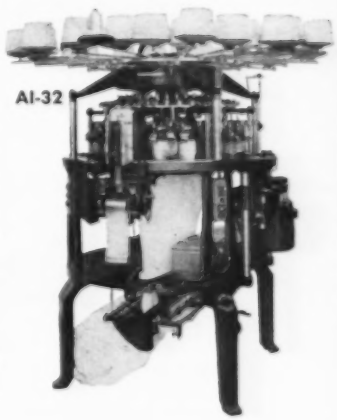

Wherever top models and discriminating people congregate sweaters that are distinctively different are accepted.

Whether it be full fashion or plain interlock, fabrics made on Wildman Jacquard knitting machines are outstanding in quality and appearance.

The "TFS" 30″ single section full fashion machine permits increased production, multiplicity of sizes to be run simultaneously, less downtime and greater ease of operation.

The model "A1" 32″ diameter 32 feed "single purpose" circular interlock machine (rib type) produces a larger, more serviceable piece of true interlock fabric.

For knitting versatility, production, and quality—specify Wildman Jacquard Knitting Machinery.

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*a subsidiary of Draper Corporation, Hopedale, Mass.*

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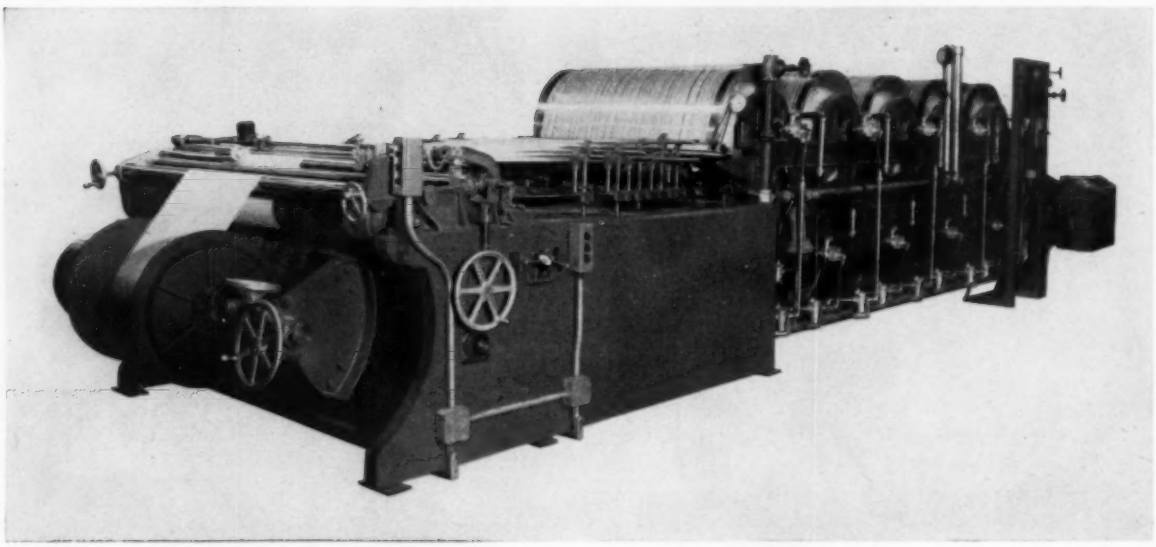
*All day long . . . sweaters belong*

*Your choice of Air-Dri® or Multi-Cylinder in WEST POINT FOUNDRY*

# SLASHERS

Yes, you have a choice with West Point Foundry, because West Point makes *both* MULTI-CYLINDER & AIR-DRI® Slashers. And *both* are high producers . . . quality producers. Whether it's a complete slasher installation or modernization of present equipment . . . call West Point Foundry . . . specialists in slashers.



*Built on heavy machined CAST IRON frames for rigidity and long service.*

**MULTI-CYLINDER SLASHER** An extremely versatile high-production slasher doing an outstanding job wherever it is installed . . . on cotton, spun and filament synthetics. Superior control of tension throughout the slasher, year after year dependable high production, and steam economy are the MULTI-CYLINDER'S strong points. Teflon coating on entering cylinders make it completely applicable to cotton and the multiple cylinders permit graduated temperature controls when required for synthetic warps. Superior tension control and greater steam economy add to your profit.

**AIR DRI® SLASHER** —A modern hot air slasher second to none —designed, made *and serviced* by an experienced slasher manufacturer located conveniently in the Textile South. AIR-DRI'S® insulated enclosure provides a clean and comfortable slasher room . . . for cotton, worsted, and spun synthetic warps. Made with two fans or three fans . . . for either 54½" or 72" warps.

*AIR-DRI is a registered trademark of West Point Foundry and Machine Co.*

## WEST POINT Foundry & Machine Company

WEST POINT, GEORGIA



← For more data, write this page number on Reader-Service card.

**Ahern Textile Print, Inc.,** Norwich, Conn., has closed down its screen-printing, dyeing, and finishing operations on drapery and slipcover fabrics.

**American Knit Fabrics, Inc.,** Maiden, N. C., has moved its operations to Bessemer City, N. C., and is operating three shifts daily.

**Amerotron Co.,** Aberdeen, N. C., has ordered 3,000 Unifils from Universal Winding Co., Providence, R. I.

**Apponaug Co.,** Warwick, R. I., will shut down. The company employs 530 people and has an annual payroll of $2,500,000.

**Barnes Lincoln Co.,** Lincoln, Me., is a new company manufacturing fancy worsted in the the former Lincolnsfield Mills property.

**Baxter Woolen Co.,** Rochester, N. H., has closed. The plant had employed nearly 200 people.

**Caledonian Dye Works,** Philadelphia, Pa., has installed two additional fully automatic, stainless-steel Hussong machines for dyeing tapes.

**Charlton Woolen Co.,** Charlton City, Mass., has bought two Whitin Model E wool spinning frames. This purchase is part of a long-term program to convert from mule to frame spinning.

**Chicopee Mills, Inc.,** New York, N. Y., has formed a Professional Products Div. The new division will manufacture and market products for the use of home patients.

**Clover Mills, Inc.,** Douglasville, Ga., is a new mill that will produce rayon and nylon carpet yarns.

**Dorman Mills,** Parsons, W. Va., has bought two 150-spindle Whitin Model E wool spinning frames and two used 18-spindle Whitin-Schweiter rewinders. The mill has placed a fifth card in operation and has changed over all five cards and its other six frames from handling 20-end spools to 30-end spools.

**Edenfield Mills,** Leesville, S. C., has closed. The plant, a subsidiary of Kent Mfg. Co., Runnymede Div., Pickens, S. C., produced French spun worsted yarns.

**Fulton Bag & Cotton Mills,** Atlanta, Ga., has sold its branch bag-manufacturing plants at New Orleans, La., and St. Louis, Mo.

**Freeland Mills, Inc.,** Wilkes-Barre, Pa., has been bought by Gerli & Co., Inc., and will be reopened.

**Griswold Textile Print,** Westerly, R. I., has bought the White Rock Mill for about $50,000.

**P. H. Hanes Knitting Co.,** Winston-Salem, N. C., has announced that it will resume manufacture of Windshield sweat shirts for men and boys. The new line will include men's crew-neck sweat shirts in both conventional construction and with a raglan shoulder. It will also offer a sweat shirt with collar and zipper front opening and another featuring a hood and pockets.

**Henderson Cotton Mills,** Henderson, N. C., has taken control of the majority of the stock of Berryton Mills, Berryton, Ga. The company plans to modernize the Berryton plant, which operated 18,000 spindles in the manufacture of singles knitting yarns.

**Hoosac Mills Corp.,** New Bedford, Mass., plans to close. The plant produces combed cotton goods and colored warp goods.

**F. C. Huyck & Son,** Aliceville, Ala., has installed a large double endless fulling mill. The fulling machine is equipped with movable pressure rolls, centrifugal stop motions, two 50-hp. motors with brakes, safety switch knock-off bars, and stainless-steel boxes and jaws.

**Jo-Mil Hosiery Co.,** Hickory, N. C., has been issued a charter with an authorized capital stock of $100,000.

**Julius Kayser & Co.,** Philadelphia, Pa., has appointed Frank G. Binswanger, Inc., exclusive real estate agent for the sale or lease of its Crown Mill in Bangor, Me.

**Lane Cotton Mills Co.,** New Orleans, La., has announced that the real-estate firm of Latter & Blum, Inc., New Orleans, La., has been appointed exclusive agent to sell the land and buildings. The property consists of seven acres and about 500,000 sq. ft. of floor space.

**Linen Thread Co.,** Paterson, N. J., is planning to close its Knox Knitting Mill, Baltimore, Md., and move the facilities to its Blue Mountain, Ala., plant.

**Penn-Carol Hosiery Mills, Inc.,** Mt. Pleasant, N. C., is building a new seamless-hosiery mill.

**Pioneer Knitwear Co., Inc.,** New York, N. Y., has moved into a 10,000-sq.-ft., one-story building in Mineola, L. I., N. Y., The air-conditioned building will house offices, stock room and shipping facilities.

**Rocky Mount Mills,** Rocky Mount, N. C., has purchased eight Hi-Pro long-draft roving frames. The frames have 96 spindles each and are equipped with new inclined roll stands. The plant has completed an antifriction spinning-spindle change-over using 12-in. bobbins.

**Vanity Fair Mills, Inc.,** Monroeville, Ala., is planning a three-fold expansion program costing about $300,000. Three portions of the mill will be enlarged, including warehouse facilities for finished merchandise, sewing room, and dyeing and finishing operations. About 125 people will be employed.

# CALENDAR

### March

**AATT,** Della Robbia Room, Vanderbilt Hotel, New York, N. Y., March 5.

**Textile Quality Control Association, spring meeting,** Poinsett Hotel, Greenville, S. C., March 6 & 7.

**Southern Textile Methods & Standards Association, spring meeting,** Clemson House, Clemson, S. C., March 13 & 14.

**Textile Research Institute of Princeton, N. J., annual meeting and symposium,** Hotel Commodore, New York, N. Y., March 13 & 14.

**American Institute of Electrical Engineers, annual Textile Electrical Conference,** Georgia Institute of Technology, Atlanta, Ga., March 13 & 14.

**American Society for Testing Materials, Committee D-13, spring meeting,** Sheraton-Park Hotel, Washington, D. C., March 18 to 21.

**American Society of Mechanical Engineers, Textile Engineering Conference,** North Carolina State College, Raleigh, N. C., March 20 & 21.

**AATCC, Hudson-Mohawk Section,** Johnstown, N. Y., March 28.

### April

**Cotton Merchandising Research Clinic, annual meeting,** Univ. of Texas, Austin, Tex., April 10 & 11.

**American Cotton Manufacturers Institute, annual convention,** Hollywood Beach Hotel, Hollywood, Fla., April 10 to 12.

**AATCC, Piedmont Section,** Washington Duke Hotel, Durham, N. C., April 11 & 12.

**Alabama Textile Manufacturers Association, annual meeting,** Buena Vista Hotel, Biloxi, Miss., April 16 to 18.

**AATCC, Midwest Section,** Netherland Hilton Hotel, Cincinnati, Ohio, April 19.

**National Association of Hosiery Manufacturers, annual meeting,** Hotel Roanoke, Roanoke, Va., April 21 & 22.

**Cotton Manufacturers Association of Georgia,** Boca Raton Hotel & Club, Boca Raton, Fla., April 23 to 26.

**Phi Psi Textile Fraternity, annual convention,** Philadelphia, Pa., April 24 to 26.

**Institute of Textile Technology,** meeting of the technical advisory committee & board of trustee, Charlottesville, Va., April 29 & 30.

**Fiber Society, Inc., spring meeting,** Clemson House, Clemson, S. C., April 30, May 1.

### May

**Underwear Institute, annual meeting,** Hotel Biltmore, New York, N. Y., May 1.

**Alabama Textile Operating Executives, spring meeting,** Thach Auditorium, Auburn, Ala., May 2 & 3.

**Canadian Textile Conference,** Queen Elizabeth Hotel, Montreal, Que., May 6 to 8.

**AATT,** Della Robbia Room, Vanderbilt Hotel, New York, N. Y., May 7.

### June

**Tufted Textile Manufacturers Association, annual convention,** Plaza Hotel, Daytona Beach, Fla., June 4 to 7.

**Materials Handling Exposition,** Public Auditorium, Cleveland, Ohio, June 9 to 12.

**National Conference on Materials Handling,** sponsored by American Society of Mechanical Engineers, to be held concurrently with the National Materials Handling Exposition, Public Auditorium, Cleveland, Ohio, June 9 to 12.

### September

**The Fiber Society, Inc.,** Montreal, Que., Sept. 9 & 10.

**AATCC, Piedmont Section,** Hotel Charlotte, Charlotte, N. C., Sept. 19 & 20.

### October

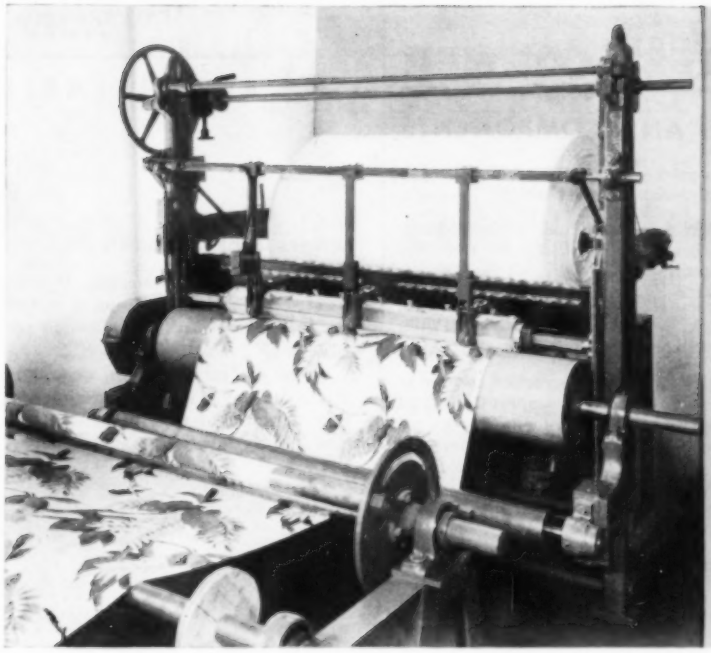
**National Cotton Council, Chemical Finishing Conference,** Washington, D. C., Oct. 1 & 2.

**Southern Textile Exposition,** Textile Hall, Greenville, S. C., Oct. 6 to 10.

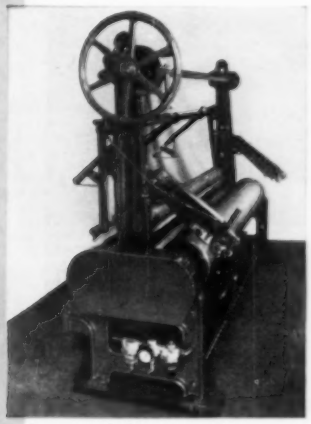
**Textile Recorder International Textile Machinery & Accessories Exhibition,** Belle Vue, Manchester, England, Oct. 15 to 25.

**Alabama Textile Operating Executives, fall meeting,** Thach Auditorium, Auburn, Ala., Oct. 25.

**AATCC, national convention,** Hotel Conrad Hilton, Chicago, Oct. 30 to Nov. 1.



Emco Rotary Cutter Winder can be used on short-run batches as encountered in screen-printed materials. Winds and cuts rolls of 12-inch minimum diameter.



Improved Simpson Pneumatic Winder features roller bearing arms and double release to doff rolls evenly to platform or truck.

Exciting new uses

# for cutting and winding equipment

Fabrics considered difficult or "impossible" to handle on rolls can now be cut and wound in range operation without slow-down or stopping. Consider these examples:

(1) Tricot knits in widths up to 168 inches—with no chance of pulls or runners in the fabric

(2) Embossed vinyl in 24-inch diameter rolls — without crushing the pattern

(3) Sanforized cloth — with no effect on shrinkage, no tension on the fabric

Let Butterworth engineers show you the production advantages of the new and improved Emco Rotary Cutter Winder, and the Simpson Pneumatic Winder. You will save the refinishing of 40 to 50 yards that, under other methods, may be soiled in completing one roll and beginning another.

**Handling is reduced. Labor is reduced. Production is speeded up. Bulletin on request.**

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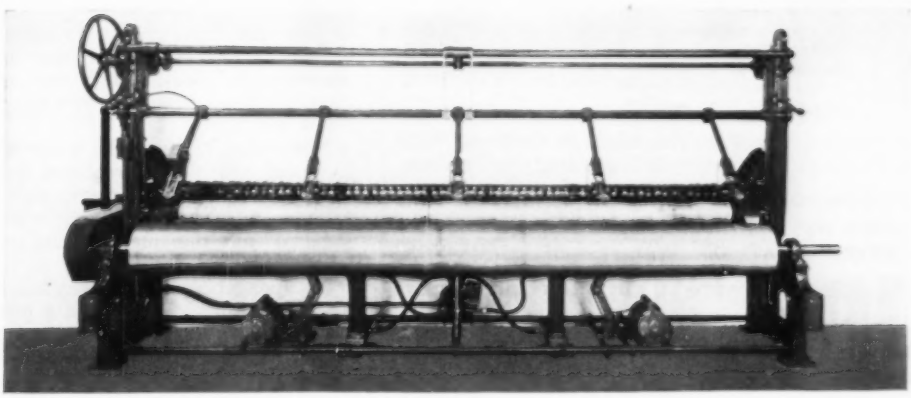
Butterworth



126-inch Emco Rotary Cutter Winder now in use in tricot finishing range. Handles fabrics gently without pulling warp threads.

Patents and patents pending



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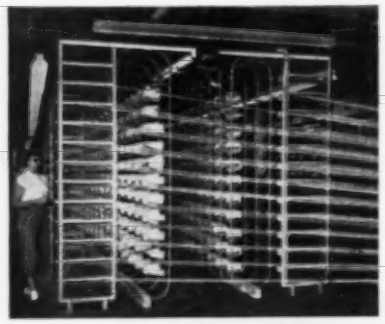
# McBRIDE CREEL CORNER

## MAGAZINE WARPING CREELS AND COMPONENTS



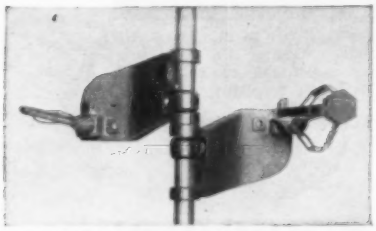
McBride SRM Inside Loading Creel. Both sides are loaded from center aisle. Also arranged for outside loading.

*Compact*—engineered to do the job within the space available.

*Flexible*—each creel is individually designed. Your needs are our first concern.

*Accessible* from loading to drawing-in, McBride creels are easily and efficiently operated.

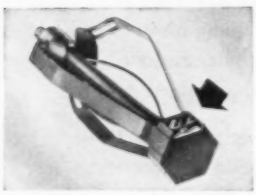
*Rigid* monorail construction and sturdy rust-proofed tubing support the largest packages and withstand the highest speeds. Package arms and tensions are easily positioned and firmly secured. The floor under the creel may readily be cleaned to prevent the accumulation of lint.



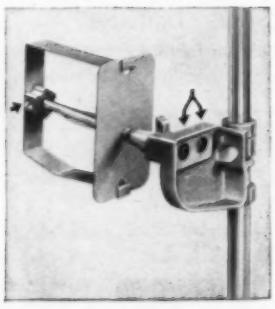
New McBride Swing Arm Assembly—completely redesigned for greater rigidity. Now the heaviest packages are securely and rigidly supported.

### McBRIDE PACKAGE HOLDERS—FLEXIBLE—VERSATILE

The Bowed Spring Spindle is tilted upward to a 5° angle to prevent slippery yarns from sloughing off the cone. Arm swings out for package change, snaps back in running position where it is secured by internal ball type spring lock held by an indented, hardened steel collar.



Quik-Change Cone Holder rotates to facilitate typing of transfer tails. Completely rust-proof, of sturdy construction, it greatly reduces changeover time from cones to tubes—of vital importance in creels of large capacity. No set screws. Just press thumb release to remove. Snaps back on.



Quik-Change Large Package Holder supports packages with inside diameter of 2" or greater. Positive spring action holds package firmly. Press button thumb release permits quick change from one style package to another.

Note that spindle arm can be repositioned for shorter radius as desired. Such flexibility saves space and increases adaptability. McBride Quik-Change Large Package Holder is available in a full range of sizes to handle any style of large package.

Let McBride Study Your Warping Situation. You Might Be Surprised With The Costs You Can Save, The Improved Quality In The Warps You Produce.

***CREELS for every purpose, CONE HOLDERS, STOP MOTIONS, TENSION CONTROLS, WARP BEAMS, FLANGES, CARPET INSPECTION TABLES, METAL AND WOOD ROLLS. COMPLETE ENGINEERING SERVICE IS PART OF EVERY McBRIDE INSTALLATION.***

**McBRIDE** COTTMAN AVE. & WISSINOMING ST.
PHILADELPHIA 35, PENNSYLVANIA

**In Canada: Hugh Williams & Co., 27 Wellington St., E. Toronto 1, Ontario**




### Letters From Readers

We welcome your comments. Whether you agree or disagree, with us or anybody else, we will be glad to have you air your views.

Unless you ask us not to, we will use your name and company connection when your letter is printed. If you prefer to have your opinions appear unsigned, we will respect your confidence by using only a set of initials.

Write to Editor, Round Table, TEXTILE WORLD, 201 E. Coffee St., Greenville, S. C.

### TWO OPINIONS ON YARN-NUMBERING SYSTEMS

Dear Editor:

The article on the Tex yarn-numbering system [TEXTILE WORLD, Aug., '57, p. 88] revives one of the proposed yarn-numbering systems that many textile men believed had been overtaken by the Grex system in the race for universal adoption.

The Grex length unit is a combination of the Tex length unit of 1,000 meters and the denier length unit of 9,000 meters; so the Grex length unit is 10,000 meters.

The international standard length of the meter has been recognized as the distance between two defining lines inscribed on an inum-iridium bar at a temperature of 0° Centigrade, known as "Meter Bar M." This bar is kept at The International Bureau of Weights and Measures at Sevres, near Paris, France.

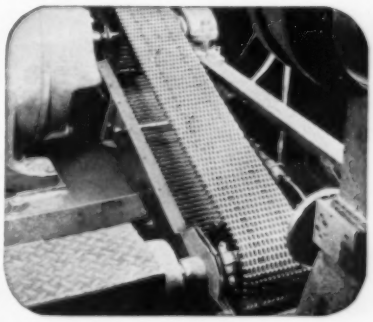
The length of Bar M is approximately one ten-millionth of a quadrant of a terrestial meridian. Such a source of the meter's origin prompted its advocates to always emphasize its claim to universal adoption by stating, "It is scientific."

Now, after 75 years, the scientists associated with the International Bureau of Weights and Measures claim to have discovered a more-accurate standard for the measurement of length.

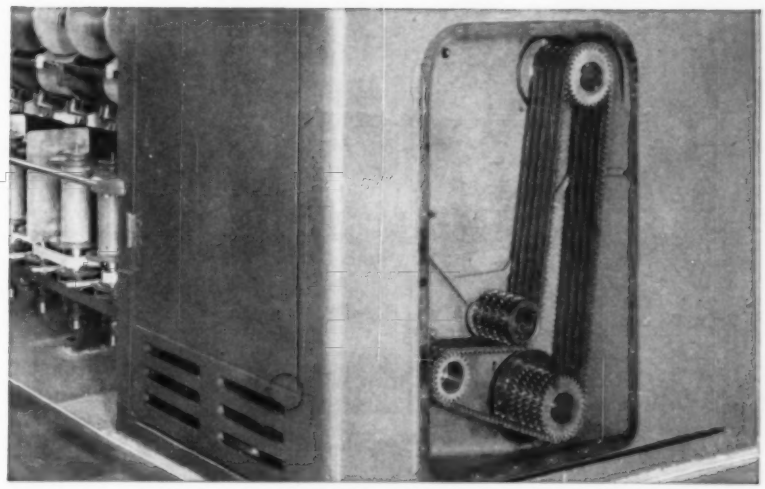
The present standard meter, based on an approximate fraction of a part of an imaginary line, a quadrant of a meridian, an arc of 90 degrees, is to be replaced by a wave length of light

## How LINK-BELT silent chain comes through industry's stiffest tests

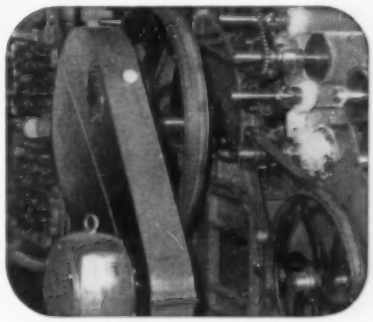
# No other drive can do the same



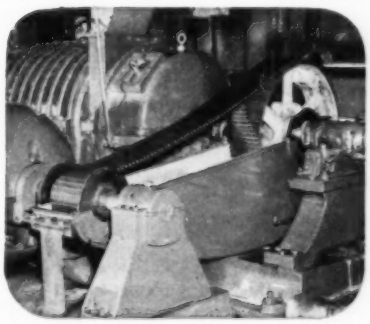
**HIGH SPEED.** Link-Belt silent chain drives often operate at speeds of 4000 to 5000 feet per minute.



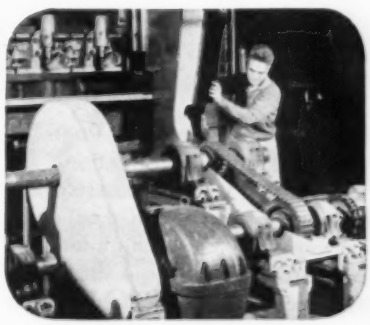
**REVERSE ROTATION OF SHAFTS.** Link-Belt duplex silent chain — capable of driving from either side of chain — operates multiple shafts on this uptwister. On fixed center drives, proper chain tension is maintained with an adjuster.



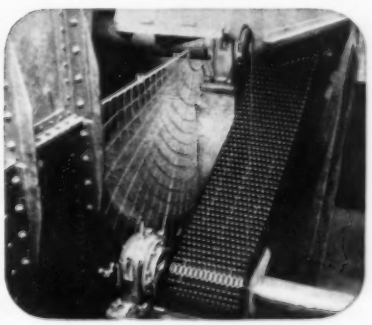
**ADVERSE OPERATING CONDITIONS.** Effects of heat, humidity and cold are minimized with Link-Belt silent chain drives.



**LARGE RATIOS.** Link-Belt silent chain operates efficiently at ratios as high as 10-to-1, with resulting space economies.



**LIMITED SPACE.** Easy to assemble in close quarters, Link-Belt silent chain permits built-in drives, compact housings.



**LONG LIFE.** Link-Belt silent chain has given more than 30 years of uninterrupted service on ventilating systems.

*Ask your Link-Belt office or authorized stock-carrying distributor for*

*88-page Book 2425*

**LINK-BELT**

**SILVERSTREAK SILENT CHAIN DRIVES**

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,815



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# MODERN DYEHOUSE EQUIPMENT

## THE DEPENDABLE KWG SKEIN DYEING MACHINE

*KWG Double Reel Skein Dyeing Machine —all stainless steel unit built in capacities to 1000 pounds.*

**FOR QUALITY DYEING**
**WITHIN INCREASED BUT MORE NORMAL TEMPERATURE and PRESSURE LIMITS**

Perfection in dyeing—for natural and the new synthetic fibers—is yours with KWG Skein Dyeing machines. Rugged construction . . . improved **'Ferris-Wheel' performance . . . give you the penetration and evenness of color**—the permanence of tone—for that extra measure of sales appeal—without concern for costly high-temperature, high-pressure methods. Dual-operations possible including scouring, dyeing and shrink-proofing, or scouring, bottom bleaching and dyeing of pastel shades.

You can point the way to extra sales . . . extra profits . . . today by writing Klauder Weldon Giles. A KWG representative will be glad to survey your needs. If necessary, he'll design special equipment to your specifications. There's no obligation.

Klauder Weldon Giles MACHINE COMPANY

**ADAMS AVENUE & LEIPER STREET • PHILADELPHIA 24, PA.**


multiplied by 1,650,763.73, or, to be more precise, 1,650,763.73 times the length of one wave length of orange light emitted by isotopic krypton of atomic weight of 86.

This method of determining linear measure is said to be more than 100 times more precise than the one which gave us the metallic Bar M.

To return to Mr. Whittier's article, I notice that the comparative numbering tables give only the numbers of yarns; the size numbers of rovings, slivers, and laps are not included. This omission is typical of almost all comparative numbering tables composed by Texists and Grexists.

It should be well known that about 70% of the world's textile products are composed of cotton, and most of the man-made fibers are processed on modified cotton spinning machinery to become spun rayon, spun nylon, etc.

Mr. Whittier limits his range of yards per pound from 12,000 to 50,000. Cotton ranging from coarse opener laps to the finest yarn spun has a length range from 2 ft. to 462,000 yds. per lb.

As far as I know, Spain is the only country in Europe where the Tex system is in operation. It was imposed on the textile industry in Spain by a governmental decree.

SQUIRE BLACKSHAW

Montreal, Que.

*In reply to Mr. Blackshaw's letter, Mr. Whittier writes:*

Dear Editor:

For many years I have been involved in one way or another with yarn weights and diameters. I am fairly familiar with all methods that have been used or proposed.

I thought that the integral system proposed a few years ago was fine and that the Typp system was a possibility. However, metric measurements are more universally used than the English unit measurements.

A direct system of yarn numbering seems more logical, and I believe that a system that uses units of measurement that are standard units is preferable.

The Tex system seems to fit all requirements because 1,000 meters is a standard unit of a kilometer as opposed to 1/20 gram, 450 meters, 9,000 meters, 560 yds., 840 yds., etc., which are not standard units.

I realize the objection to the Tex number when it is applied to fibers or small filaments, but I believe this objection could be overcome by using Tex numbers on spun yarns or multifilament yarn and using decitex numbers (equivalent to Grex numbers) on



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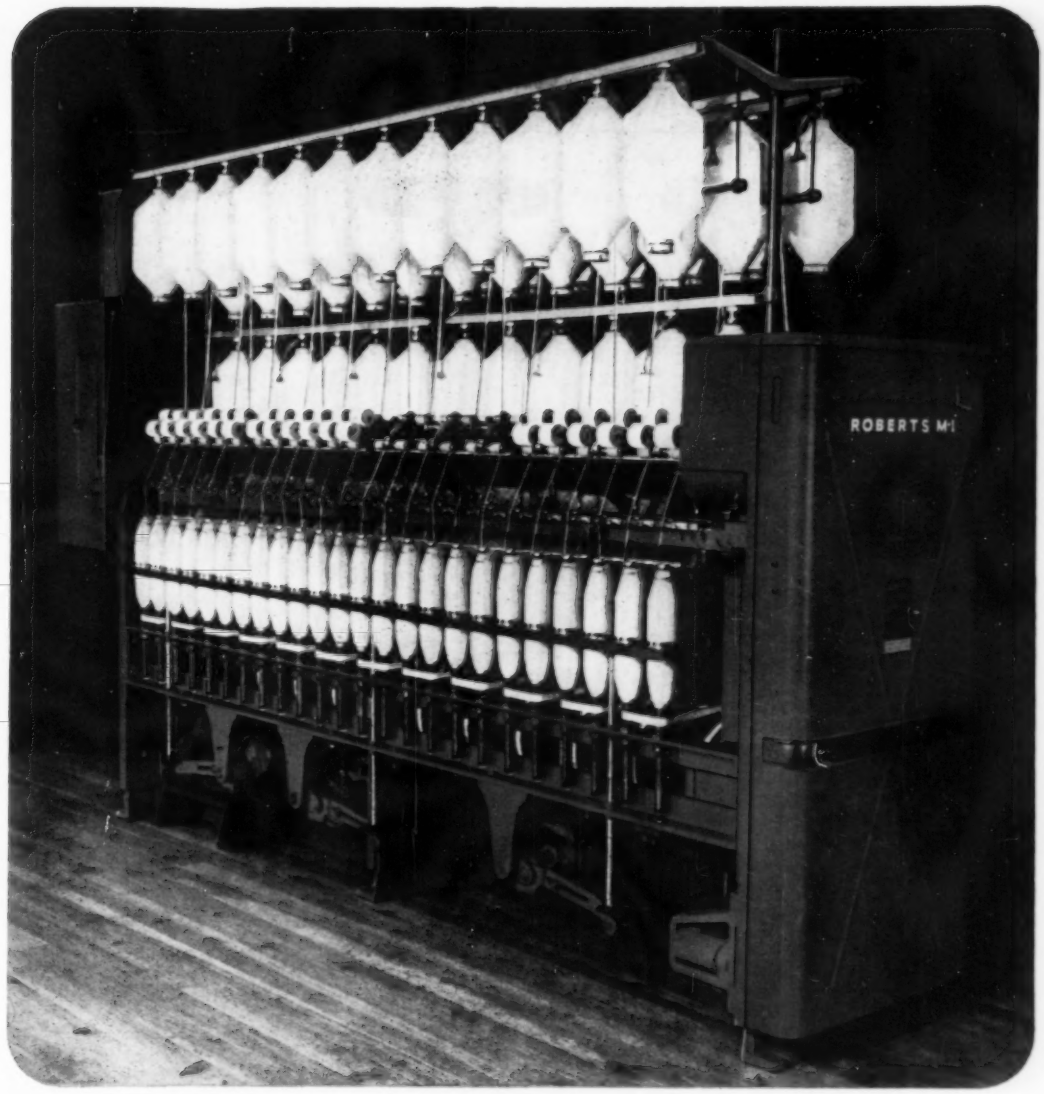


# ROBERTS SPINNING

## ALL NEW—ALL BALL BEARING ROBERTS M-1 SPINNING FRAME

### MODERN IN DESIGN

Into the rugged simplicity of the Roberts M-1 chassis has been built all the ball bearing features needed to provide the smooth operation and productivity for today's and tomorrow's production goals. Standard features include:

- FLEXIBILITY FOR COTTON AND SYNTHETICS
- BALL BEARING TOP ROLL SUSPENSION
- BALLOON CONTROL ARRANGEMENT
- BUILT-IN UnitVac SUCTION CLEANING
- EXTRA CAPACITY SPINDLES
- FULL BALL BEARING HEAD
- 45 DEGREE ROLL STANDS
- LATCH-TYPE BOBBIN HOLDER AEROCREEL
- STEEL BASE RAILS, ROLL BEAMS, RING RAILS
- ADJUSTABLE DRAFT CONSTANT, 500 to 3000
- TURNKEY ERECTION AND STARTUP

### PROVEN IN PERFORMANCE

New Roberts Spinning has been running in the mill since February 1956 and has proven itself not only most economical in initial cost but low in maintenance. One large user with more than 200 frames in continuous production reports that the new Roberts Spinning runs with higher front roll speeds, better yarn quality and substantially lower ends down than the several thousand frames of other makes in operation in their mills.

**ROBERTS COMPANY**

SANFORD, NORTH CAROLINA



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# FAIRBANKS

**UNION BONNET GATE VALVES**

125 lb.

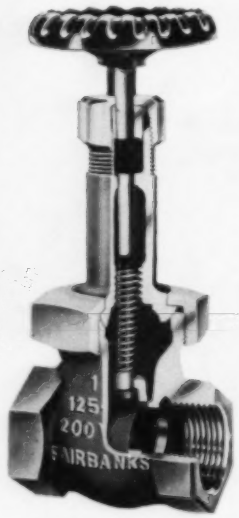


**FIGURE U-0252** Rising Stem. Solid Wedge. Taper Seat. 125 Pounds Steam Working Pressure. 200 Pounds Cold Water, Oil or Gas Pressure. Non-Shock.

150 lb.

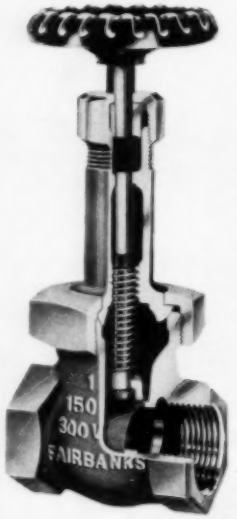


**FIGURE U-0226** Rising Stem. Solid Wedge. Taper Seat. 150 Pounds Steam Working Pressure. 300 Pounds Cold Water, Oil or Gas Pressure. Non-Shock.

**Two-Piece Union Bonnet Construction For Extra Easy Assembly And Disassembly**

Two-piece **Radial Seat** Union Bonnet Construction provides extra easy assembly, long service, dependability that gives you extra value. **Radial Seat** provides line contact through accurately machined true ball and socket mating surfaces, for leakproof body bonnet joint. Two-piece construction eliminates sliding or scraping — prevents scoring — of body and bonnet mating surfaces during assembly and insures even contact pressure for perfect alignment of working parts. Heavy union nut will not deform under pressure and protects body and bonnet from distortion. Valves may be repacked under pressure when wide open—top seat above threads—out of line of flow—is protected against deposits and excessive wear.

**SERVICE:** Recommended for general service on steam, water, gas, and oil lines where full, unrestricted flow is desired. Valves give long trouble-free operation.

**YOURS ON REQUEST:** Colorful, illustrated brochure fully describes Fairbanks Bronze Gate Valves with Union Bonnet Construction, complete with specifications and details. Write for your free copy today.

**Order Fairbanks products through your local distributor who is always happy to serve you.**

THE **Fairbanks** COMPANY

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fibers and monofilament.

It will probably be a long time before this Tex system will be in universal use, but I think it has a better chance than any other system that has been proposed. It is true that Spain is the only country where the Tex system is in full operation. However, in many other countries, in specifications, test methods, and scientific writings, the Tex numbers are being used more and more.

I hope that more articles will be written and published on the subject and that some progress may be made toward the adoption of a universal yarn-numbering system.

B. L. WHITTIER
N. C. State College
Raleigh, N. C.

## CORRECTION

Dear Editor:

An item in TEXTILE WORLD [p. 9, Jan., 1958] under "Sales Off at Cannon," reads as follows:

"Profits in the first half of 1957 amounted to $843,275 . . ."

According to Moody's Industrials [p. 1,816, Jan. 10, 1958] Cannon Mills Co. earned net profit (after taxes) of $4,843,275 in the six months ended June 30, 1957.

Apparently you left out the "4" in front of the 1957 profit figure, thereby reducing Cannon's reported profits by $4-million. I'm sure Mr. Cannon wouldn't approve.

SOLOMON BARKIN
Director of Research
Textile Workers Union of America
New York, N. Y.

## OUR COVER

Photo by Coxe Studios, Greenville, S. C.



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What makes

# V-Belts with the Green Seal

your best belt buy—

by far

**A** Special tension members of steel cable or exclusive, synthetic Triple-Tempered (3-T) Cords—carefully tempered with Tension, Temperature and Time for maximum strength with minimum stretch.

**B** Tension and compression sections of mildew-inhibited rubber compounds—designed to the job—and manufactured to team perfectly with whatever type load-carriers are used.

**C** Envelope of exclusive, bias-cut fabric impregnated with a minimum dusting, mildew-inhibited, friction-balanced rubber compound for long running without sticking or grabbing in the grooves.

## —AND IT PAYS OFF IN

Dimensional Stability for belts that don't shrink or stretch in storage — for matched sets that *stay* matched

High Strength and Low Stretch on the drive—for maximum resistance to shock loads—minimum creep and take-ups

Clean, Smooth-Running Operation for maximum trouble-free, horsepower hours of operation—lowest possible power transmission costs

## —SO NEXT TIME YOU NEED V-BELTS

—be sure you get belts with the Green Seal. See your Goodyear Distributor for details. Or write Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.

DIMENSIONALLY STABLE V-BELTS with the GREEN SEAL by

**GOODYEAR**

60 GOODYEAR

THE GREATEST NAME IN RUBBER

Watch "Goodyear Theater" on TV—every other Monday, 9:30 P.M., E.S.T.

Green Seal—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio



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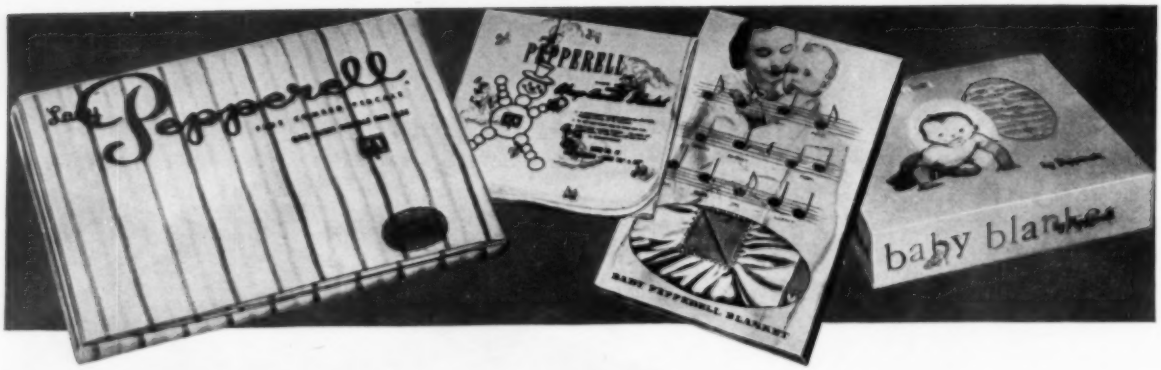



# Together . . . for over 50 years!

Pepperell Manufacturing Company in textiles; American Moistening Company in air conditioning . . . *both* are well-known not only to the trade, but to each other! For it was over 50 years ago that the first Amco installation was made in a Pepperell mill. Moreover, it's a business association which has continued active right up to the present.

Amco's developments in improved methods of air conditioning today include a full list of carefully engineered devices, as well as *all* types of systems. So whether *your* requirements are for humidification alone; or in combination with cooling, such as in a ductless evaporative cooling system; or for a unit dry-duct system; or central station air conditioning . . . Amco can offer you the *right* system, composed of quality components, and based on engineering backed by seventy years experience in textile air conditioning.

Call on Amco for reliable advice. Amco engineers will be glad to suggest a solution to any air conditioning problem you may have. There is absolutely no obligation.

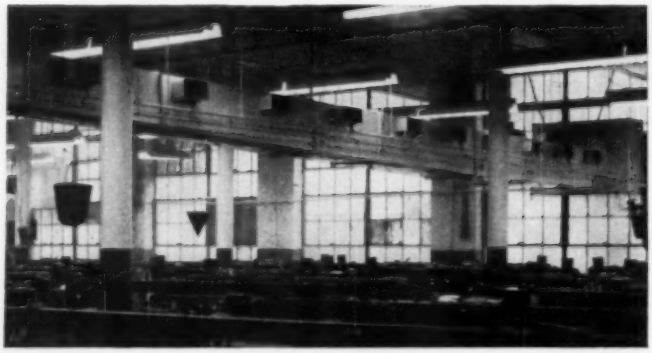
Amco cooling and ventilating installation in spinning room of Pepperell plant.

Some departments in the mill use straight humidification with Amco atomizers.

# AMCO

**AIR CONDITIONING SYSTEMS**

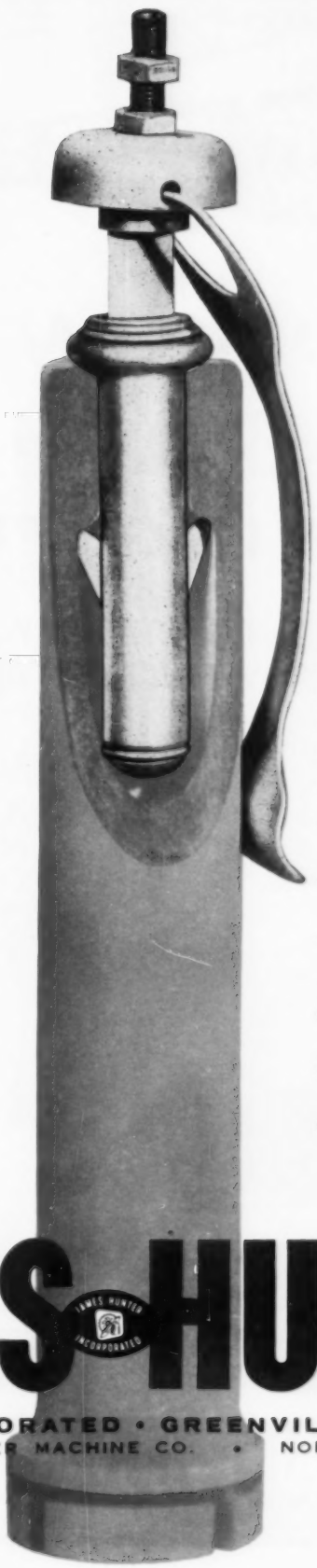
AMERICAN MOISTENING CO. • CLEVELAND, NORTH CAROLINA
BRANCHES:
ATLANTA, GA. • PROVIDENCE, R. I. • TORONTO, ONT.



Amco unit dry-duct system installed in weave room.

LINT
CAN'T CLOG
THE NEW

# HUNTER BOBBIN HOLDER



The new Hunter Bobbin Holder is specially designed to keep lint from clogging spinning frame creeling operations. Two independently retractable spring-loaded holding fingers provide a positive hold on the roving bobbin, automatically centering it and letting off the roving concentrically. A brake can be added at any time without removing the bobbin holder from the creel. The entire unit is protected by a dust cap, and all parts are corrosion-resistant. Make the change to Hunter Bobbin Holders now, for smoother, easier, more economical creeling.

**EXCLUSIVE HUNTER ADVANCES FEATURED IN REVOLUTIONARY DESIGN**

- No sliding collars or tripping and latching devices — only 2 actuating parts.
- Enclosed top above bobbin keeps lint out of Bobbin Holder.
- Convex dust shield deflects lint- and dirt-carrying currents downward, away from bearing.
- Holds all sizes of roving bobbins, from 8 x 4 to 12 x 7 inclusive.
- Adaptable to any make or model creels, including wooden strip creels.
- Can be disassembled easily, for repair or parts replacement.

# JAMES HUNTER

**JAMES HUNTER INCORPORATED • GREENVILLE, SOUTH CAROLINA**
A SUBSIDIARY OF JAMES HUNTER MACHINE CO. • NORTH ADAMS, MASSACHUSETTS



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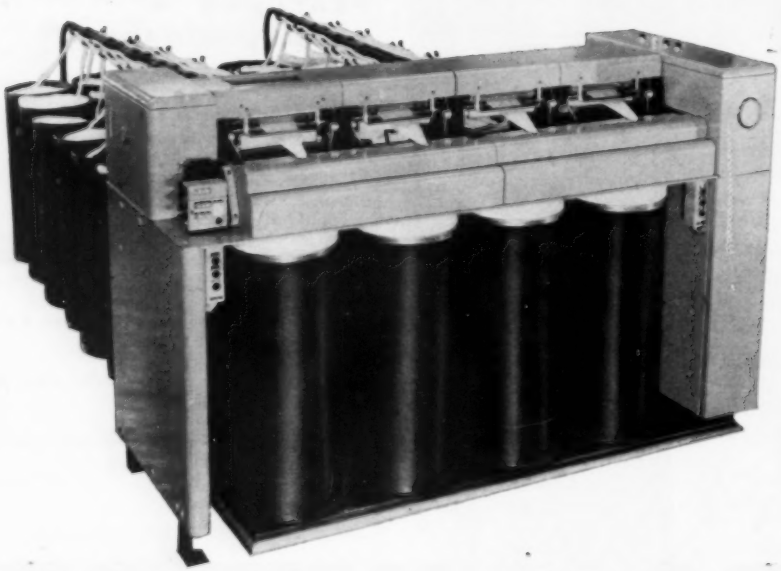
A HIGH PRODUCTION MACHINE
THAT BELONGS IN YOUR MILL

# SACO-LOWELL'S
# VERSAMATIC
## DRAWING FRAME

***KEEPS YOU AHEAD OF COMPETITION BY LOWERING OPERATING COSTS, INCREASING PRODUCTION, IMPROVING QUALITY.***



**VERSAMATIC** *GIVES HIGHEST PRODUCTION OF QUALITY SLIVER BY EVERY STANDARD –*

- **PER DELIVERY**
- **PER MAN HOUR**
- **PER HORSEPOWER**
- **PER SQUARE FOOT OF FLOOR SPACE**

Invest a few moments time today to obtain all the facts from your SACO-LOWELL Sales Office — it's an investment that can result in a sounder, more profitable tomorrow for your mill.

**SACO-LOWELL SHOPS**

60 BATTERYMARCH STREET, BOSTON 10, MASS.

Shops at BIDDEFORD & SACO, MAINE; SANFORD, N.C.; EASLEY, S.C. Sales Offices: CHARLOTTE · GREENSBORO · GREENVILLE · ATLANTA



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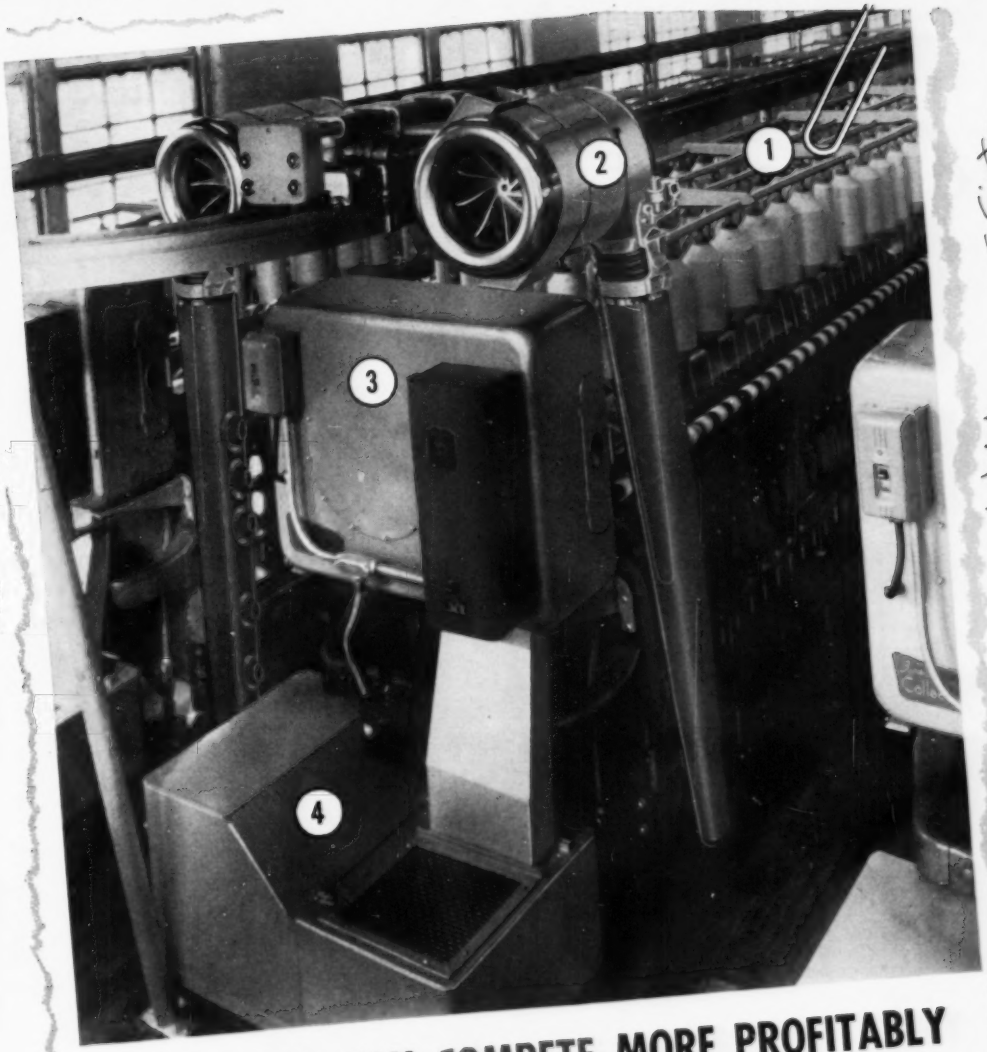


J.V.
this looks interesting - what do you think Bill

Bill - certainly think now is the time to look into it. J.V.

Let's check with Bahnson right away - ask for more details on the equipment. Bill

# YOUR MILL CAN COMPETE MORE PROFITABLY WITH THIS KIND OF MODERNIZATION

Note the spinning frame in the picture. It has been modernized with specialized *all Bahnson* equipment. The resulting benefit is a greatly improved competitive position for this mill through substantial annual savings on direct labor costs and increased production of a better quality product. Co-ordinated modernization with one source added initial savings, too.

In the modernization of this spinning room Bahnson co-ordinated the installation of the following specialized equipment, numbered in the illustration:

1. Bahnson **OPEN-AIRE CREEL**, the only open creel made of rugged steel with baked enamel finish.
2. Bahnson **CROSS-JET CLEANER** for cleaning entire frame in addition to walls and ceilings.
3. Bahnson **COLLECTO-VAC** for uniform collection of ends, lint, and fly through warp-free aluminum flutes.
4. Bahnson **CENTRAL HEAT REMOVAL** to take out heat from collection units and motor alley.

Bahnson representatives will be pleased to explain the application of this kind of modernization to your individual mill need. Write or call Bahnson today. No obligation.

**Bahnson**
COMPANY
WINSTON-SALEM, N. C., U. S. A.

Air Conditioning
Vacuum Collection
Central Heat Removal
Cleaning
Creels


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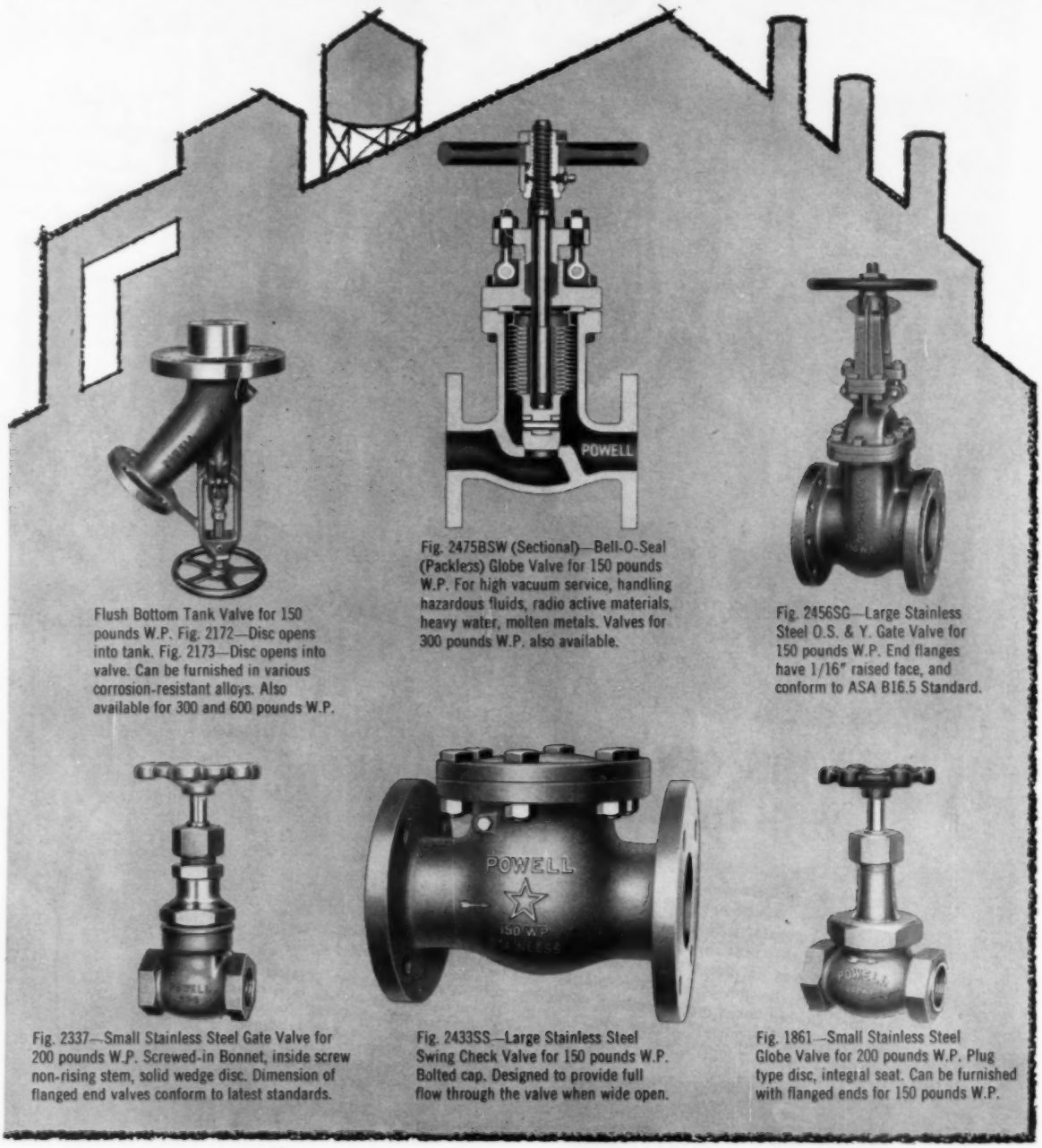
# POWELL

## world's largest family of valves




Flush Bottom Tank Valve for 150 pounds W.P. Fig. 2172—Disc opens into tank. Fig. 2173—Disc opens into valve. Can be furnished in various corrosion-resistant alloys. Also available for 300 and 600 pounds W.P.

Fig. 2475BSW (Sectional)—Bell-O-Seal (Packless) Globe Valve for 150 pounds W.P. For high vacuum service, handling hazardous fluids, radio active materials, heavy water, molten metals. Valves for 300 pounds W.P. also available.

Fig. 2456SG—Large Stainless Steel O.S. & Y. Gate Valve for 150 pounds W.P. End flanges have 1/16" raised face, and conform to ASA B16.5 Standard.

Fig. 2337—Small Stainless Steel Gate Valve for 200 pounds W.P. Screwed-in Bonnet, inside screw non-rising stem, solid wedge disc. Dimension of flanged end valves conform to latest standards.

Fig. 2433SS—Large Stainless Steel Swing Check Valve for 150 pounds W.P. Bolted cap. Designed to provide full flow through the valve when wide open.

Fig. 1861—Small Stainless Steel Globe Valve for 200 pounds W.P. Plug type disc, integral seat. Can be furnished with flanged ends for 150 pounds W.P.

**For every flow control problem** Powell offers more kinds or types, available in the largest variety of metals and alloys to handle every flow control requirement. Powell distributors are located in all principal cities and maintain inventories to fill almost any need. For special engineering problems, write direct to:

**THE WM. POWELL COMPANY** • *Dependable Valves Since 1846* • **Cincinnati 22, Ohio**



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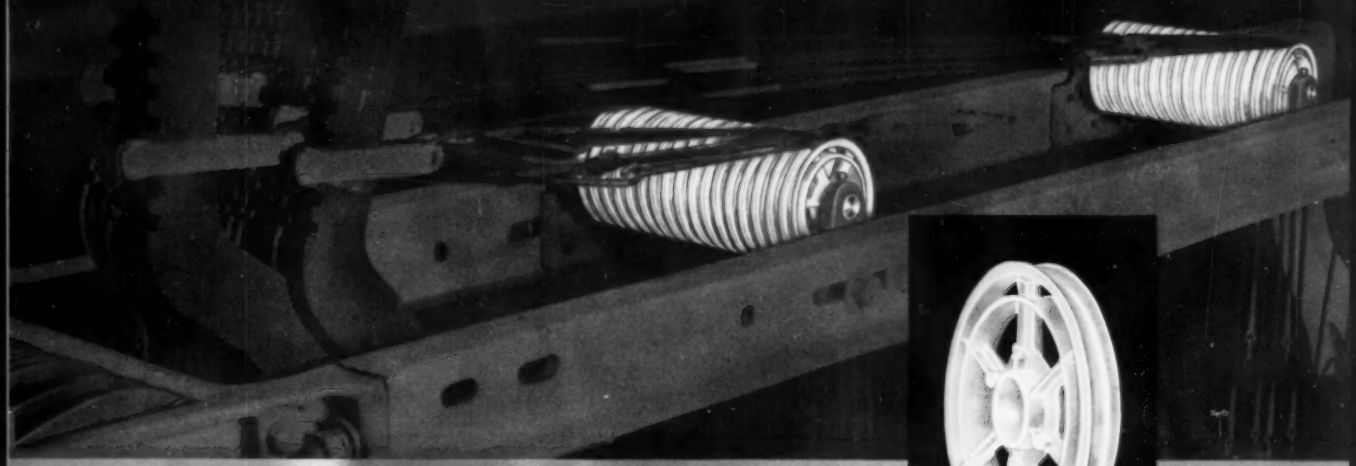
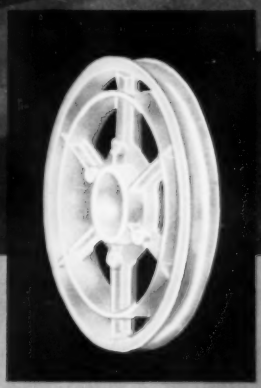
# Are you getting 2 years of operating life from your present dobby sheaves?

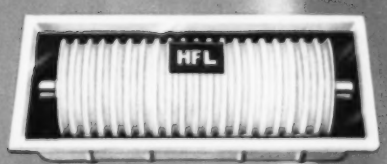




## You can now . . . with the astounding new development of HFL ENGINEERED NYLON dobby SHEAVES*

**Made of ZYTEL** (DuPont's trade mark), controlled and prepared by us, HFL NYLON dobby SHEAVES have *entirely eliminated* the problems that existed in plastic and other sheaves formerly available to mills. Exhaustive tests in the HFL Pilot Weave Room, on looms carrying loads *up to three times their normal requirements*, prove that

- dimensional stability is maintained because HFL SHEAVES do not absorb moisture;
- swelling, warping, flaking and seizing are gone . . . *forever;*
- heat is dissipated, thus prolonging the life of dobby cords;
- the special chrome plated HFL Dobby Shaft is an important factor in reducing friction and providing *long, uninterrupted sheave service.*




Conveniently packaged: 20 sheaves on special chrome plated steel shaft. Plastic tray has partitions — is suitable for secondary use.

**This is another milestone** in the long series of HFL IMPROVED LOOM PARTS . . . another indication of continued *Livermore leadership* in research.

*Send today for descriptive bulletin.*

PATENT PENDING

HFL
IMPROVED LOOM PARTS

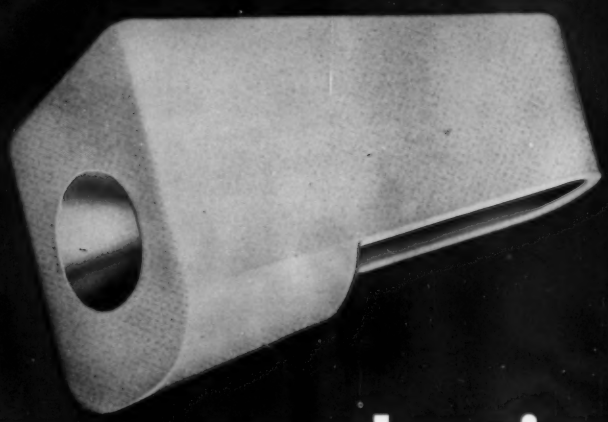
**H. F. LIVERMORE CORPORATION**

*ESTABLISHED 1887*

EXECUTIVE OFFICES & PLANT
BOSTON 34, MASS.

SOUTHERN DIVISION
GREENVILLE, S. C.

# Why Tex-Hide loop pickers increase loom production



## Parallel Hole reduces down-time for adjustments

In America's largest mills . . . on thousands of looms . . . the *correctly* shaped shuttle hole in TEX-HIDE Loop Pickers help to increase production and decrease costs.

Because the hole is parallel to the axis of the shuttle, the picker is *fitted* to the shuttle spur right from the start; no need for wearing the hole into shape.

Adjustments are not required every few hours until picker is "worn in". The parallel hole insures uniform wear and up to three times longer service life.

Shuttle hole in Gates TEX-HIDE Picker is parallel to axis of shuttle.

Shuttle hole in ordinary picker is shaped like this.

### *Shutdowns due to picker failure practically eliminated*

TEX-HIDE Loop Pickers absorb shock better than the finest leather. They help eliminate shuttle bounce and sluffing off or breakage of yarns; greatly increase shuttle life (up to 40% in some cases.)

For better, faster, more economical production, equip your looms with *all* Gates *specially engineered* accessories. Less down time and fewer rejects in cloth.

Gates Distributors are in the Yellow Pages

**The Gates Rubber Company,** Denver, Colorado

Gates — The Mark of *Specialized* Research

TPA 162

Take-up Roll Coverings
Card Bands
Cone and Evener Belts
Spinning Frame Drives

Reversible Pickers

Tex-Hide Harness Straps

Tex-Hide and Vulco Loop Pickers

Thin-Tex, Vulco, Tex-Hide & Super Tex-Hide Lug Straps

# Gates Textile Accessories

# HIGH TIME..

## . . . to Modernize Your Mill with New American Textile Machinery . . . NOW

Today, American textile machines of all types are at an all-time high in adaptability of design . . . versatility of use . . . quality and quantity of production.

*Never has any textile mill been able to get so much for so little.*

And never has competition been so tough. Never has outdated equipment been such a liability, such an open invitation to diminishing returns.

Yet surveys show that a dangerously high percentage of pre-war equipment is still in use today.

What are you waiting for? The time is right. Prices are right. Terms are right. It's high time to modernize, *now* . . . for the future of *your* mill.

**VEEDER-ROOT**


**INCORPORATED**

**HARTFORD 2, CONN. • GREENVILLE, S. C.**

Chicago 6, Ill. • New York 19, N. Y. • Altoona, Pa.
Los Angeles • San Francisco • Montreal 2, Canada

*Offices and Agents in Principal Cities*

. . . and here's why it's wise to make sure all your New Machines are equipped with NEW VEEDER-ROOT COUNTERS . . .

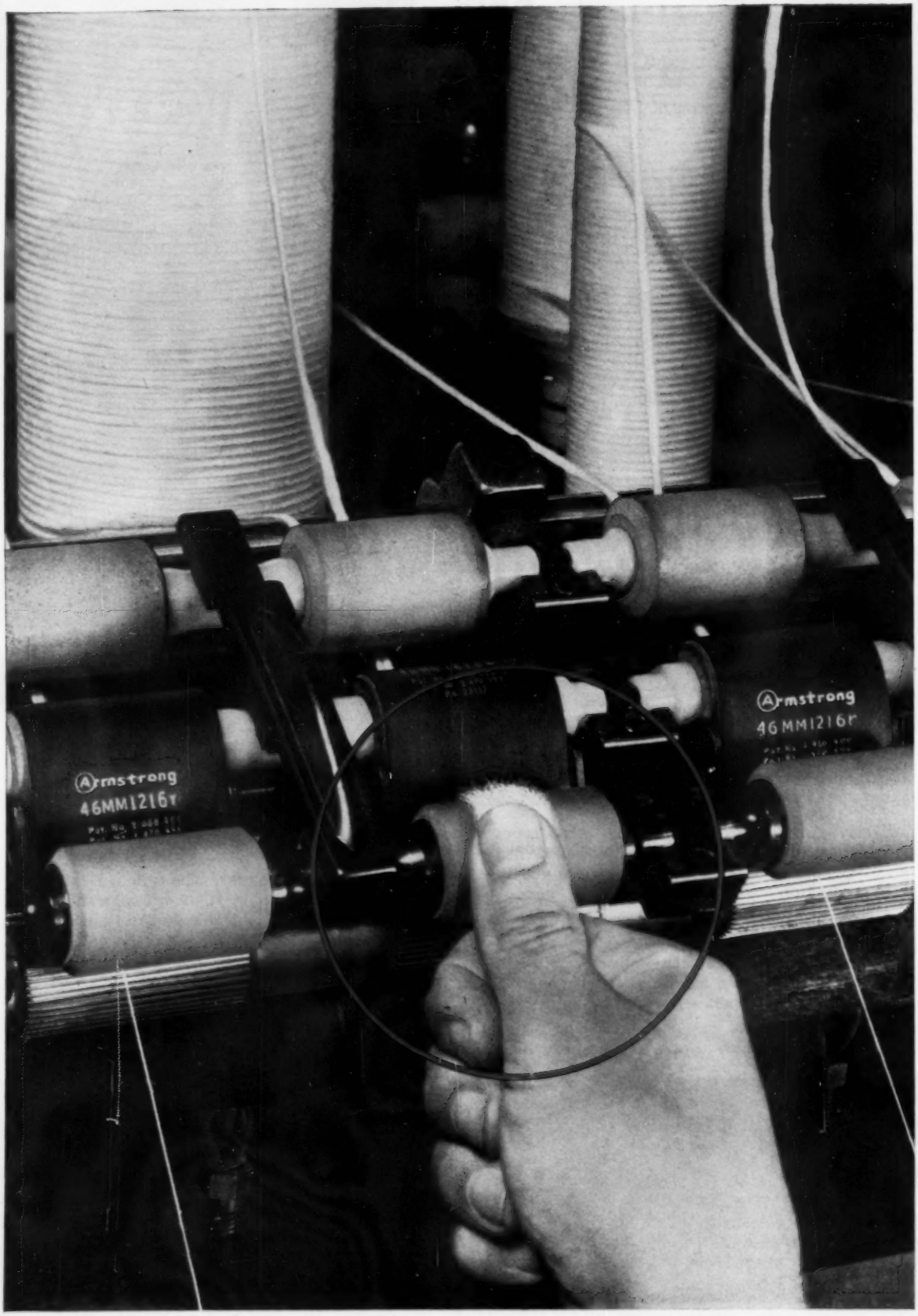
Modern Veeder-Root Counters . . . for looms, frames, knitting machines and all types of textile mill equipment . . . are built with unmatched Veeder-Root know-how and quality to give accurate facts-and-figures through years of trouble-free service. Count on Veeder-Root for *closest* Control of production and uniformity. Write Veeder-Root for all your counter needs.

2-3-4 Convertible Counters for looms, frames, knitting machines, etc.

Loom Cut Meters for controlling uniform cuts of cloth.

Vary-Tally Multiple Unit Reset Counters for inventory, inspection, and 1,001 other hand-counting jobs.

Double-Wheel Linear Counter for indicating lengths in feet, yards, etc.


Armstrong
46MM1216r
Armstrong
46MM1216r

# lapping . . .

## How this source of trouble and expense can be minimized with Armstrong Accotex Cots

Front roll laps obviously cost you money in lost production and in the labor used to clear them and get the ends running again. And there is always the risk of damaging the cot if a tight lap has to be cut away.

Lapping can increase your costs in other ways as well. A lap that builds up on one cot can cause irregularities in the yarn produced by the other cot on the same arbor. This happens because a lap, in effect, increases the diameter of a cot and thus upsets the weight distribution on the arbor. The higher weighting on the non-lapping cot can actually result in premature wear of some roll covering materials.

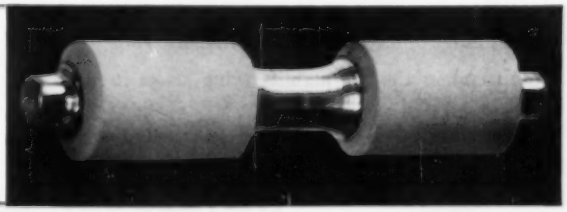
Hundreds of mills have proved that the expense and trouble caused by lapping can be reduced to a minimum with Armstrong Accotex Cots. The Accotex line includes a number of materials that are specially compounded to eliminate lapping.

For example, Accotex J-490 Cots, made of a patented synthetic rubber material, contain electrolytes that tend to repel broken ends and prevent them from lapping.

Where high static aggravates the lapping problem, one of the new anti-static Accotex materials is often the solution. These new materials are made especially to minimize lapping on frames where non-metallic cap bars are used and where other metal-to-metal contacts have been eliminated.

Your Armstrong man can help you select the right Accotex roll cover for best performance on your equipment, whether you're spinning natural fibers, synthetics, or blends. Call him today or write Armstrong Cork Co., 6503 Dauphin St., Lancaster, Pa.

For long service life and freedom from lap-ups, choose one of the Accotex Cots with built-in lap resistance. Typical of these time- and money-saving cots is the Accotex J-490, now used in hundreds of U. S. mills.



**Armstrong** ACCOTEX COTS

*. . . used wherever performance counts*



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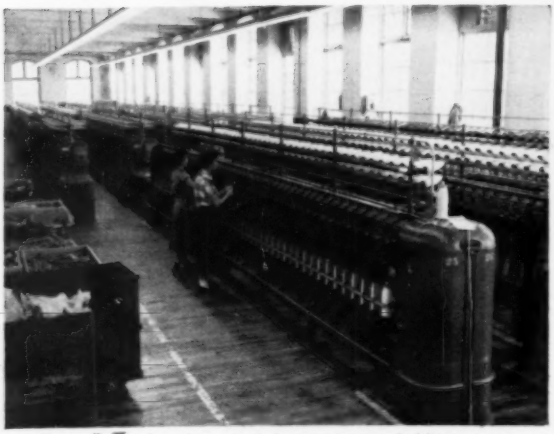
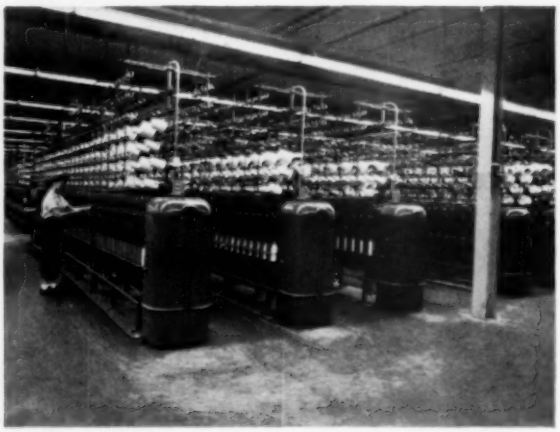
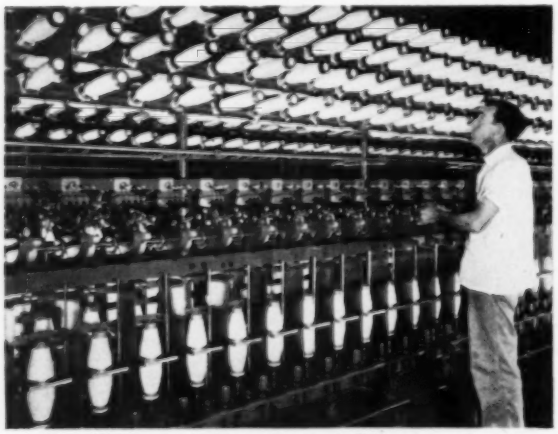
# Leesona® Model 10 puts a wonderful twist on any yarn



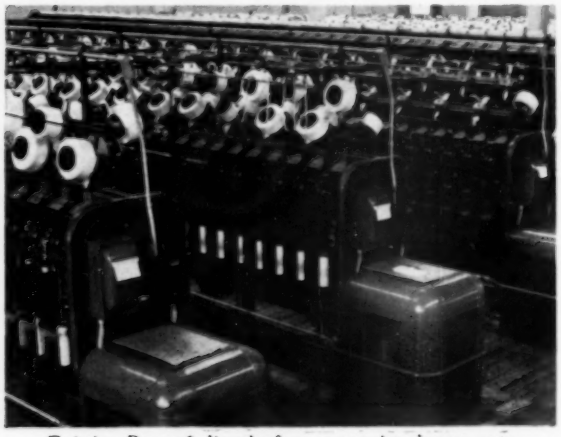
Twisting wool and worsted from spinning bobbins onto taper-top, take-up packages, as supply for winding machines.



Worsted, synthetic and metallic yarns from cones are plied together, twisted and taken up on large packages.



Twisting glass yarn from pirns to double-taper packages which will be used for filling and warping without re winding.



Twisting Dacron* directly from zero-twist cheeses onto straight wind bobbins for further processing on high speed UNIRAIL® Uptwisters.

The world's best yarns — and all the others too — natural or synthetic — spun or filament can be plied and twisted best on a Leesona Model 10 Ring Twister.

With it you twist single end yarn or combine two to 16 ends, with a twist range of ½ to 55 turns. Automatic stop motion for each end in the ply permits tying knots in singles.

Here's the most versatile of twisting machines ready for any kind of package delivery — cones, cheeses, cakes, pirns, spools, bobbins or tubes. Produces straight wind, taper-top or double tapered take-up packages (filling or warp wind).

For more facts and figures write for Leesona Model 10 Ring Twister Bulletin 10-A.

*Dacron is a DuPont registered trademark.

**UNIVERSAL WINDING COMPANY**

P. O. BOX 1605, PROVIDENCE 1, R. I.

Sales Offices: Boston • Philadelphia • Charlotte • Atlanta • Los Angeles
Montreal • Hamilton, Canada

*Agents in every principal textile center throughout the world*

23.7.6



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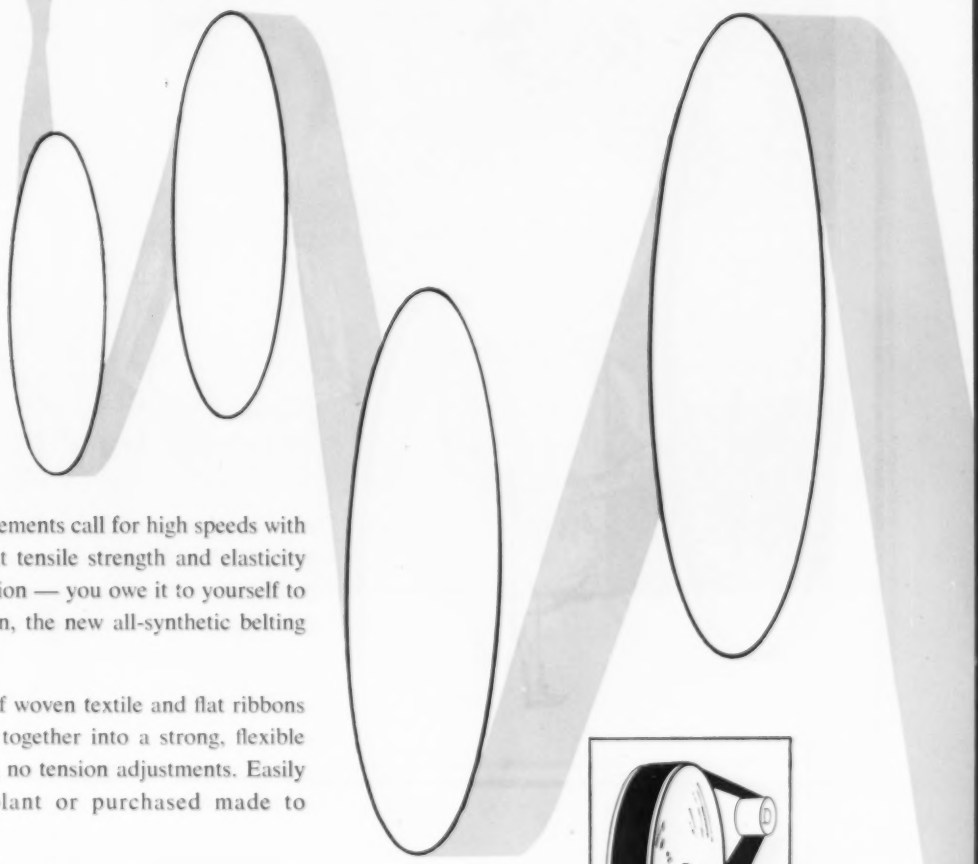
# Texalon

## laps easily in minutes . . . operates smoothly at speeds up to 10,000 FPM



If your flat-belt drive requirements call for high speeds with high-pulley ratios . . . great tensile strength and elasticity . . . high co-efficient of friction — you owe it to yourself to investigate Rhoads' Texalon, the new all-synthetic belting for modern drives.

Texalon is a combination of woven textile and flat ribbons of extruded nylon, welded together into a strong, flexible belting. No belt shortening, no tension adjustments. Easily made endless in your plant or purchased made to specification.

At Rhoads, an experienced belt-drive engineer recommends the flat belt that is exactly right for your operating conditions. It may be Tannate leather belting, the product of 256 years of tanning experience. It may be Tanastic, new leather/plastic belting with a stretch-free nylon core. Or it may be Texalon — for facts on Texalon write for new 6-page data folder and sample. Address Engineering Department, J. E. Rhoads & Sons, Wilmington 99, Delaware.

In nearly every application, when all factors are considered, the most economical means of Power Transmission is the Belt Drive.

# RHOADS

**Since 1702 . . . Pioneers in Mechanical Power Transmission**

Did you know we could lick your yarn-breaking, puff-balling, dye-streaking headaches for you with both (so to speak) hands tied behind our backs?

We can.

Because we process our rayon yarn with a strictly hands-off policy!

I.R.C. Continuous Process Rayon is actually processed in a continuous individual thread treatment . . . goes from spin-bath to bobbin without once being touched by anybody's hands!

That means there's no chance whatever of your getting the yarn damages caused by multiple handling, as in ordinary rayon processes. And that means we virtually eliminate the breaks, the puff-balls, the lack of uniformity that give you fabric "seconds" headaches!

We'd like you to see the process at our famous Painesville, Ohio plant. Barring that, why not have us come to see you, at yours?



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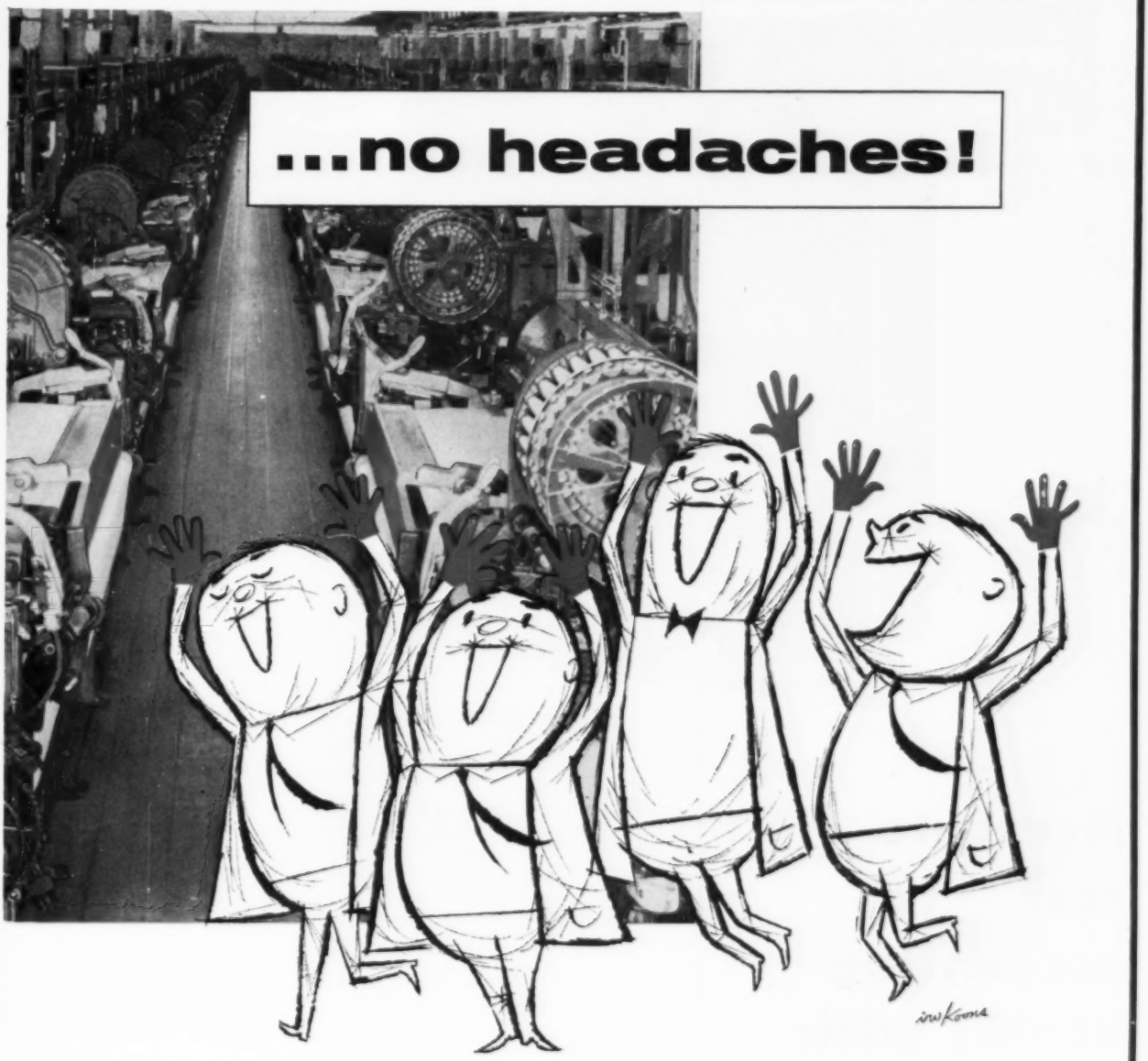


**I·R·C**

**Industrial Rayon Corporation**
**Cleveland, Ohio**

Producers of Continuous Process Rayon Yarns
and Tyron® Cord for Tires
Sales Office: 500 Fifth Ave., New York 36, N. Y.

**IRC CONTINUOUS PROCESS RAYON COSTS NO MORE...SAVES YOU PLENTY BECAUSE IT'S PERFECT INCH BY INCH . . . UNIFORM MILE AFTER MILE!**



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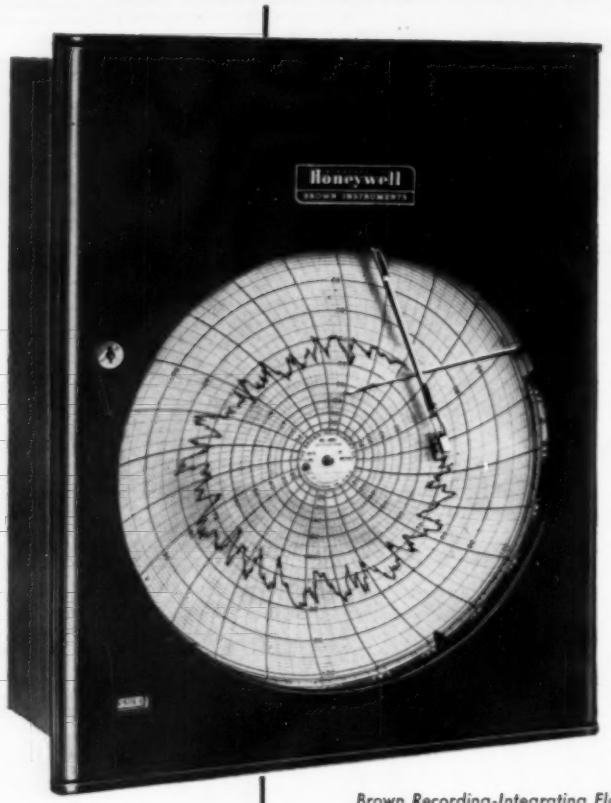



*Brown Recording-Integrating Flow Receiver*

**HONEYWELL FLOW METERS HANDLE:**

steam
hot water
fuel
size
dye
caustic

# Accurate cost accounting begins with Honeywell flow meters

WHAT is the cost of process flows for your washers . . . J boxes . . . saturators . . . dye rooms . . . finishing operations? You must have accurate records of the quantities of steam, water, air, chemicals, fuel oil and other fluids supplied to each department to know where your money goes and why.

***Honeywell Flow Meters aid cost accounting by providing:***

1. Continuous totalizing of flows.
2. A means of establishing an accurate basis of costs.
3. A close check on waste, enabling savings in steam, water and chemicals.
4. Warning of abnormal conditions which could be costly if unremedied.

They provide continuous, accurate flow measurement and fast, precise, electronic integration. All instruments are designed to withstand severe industrial conditions, and require only a minimum of maintenance.

Call your nearby Honeywell field engineer for details. He's as near as your phone.

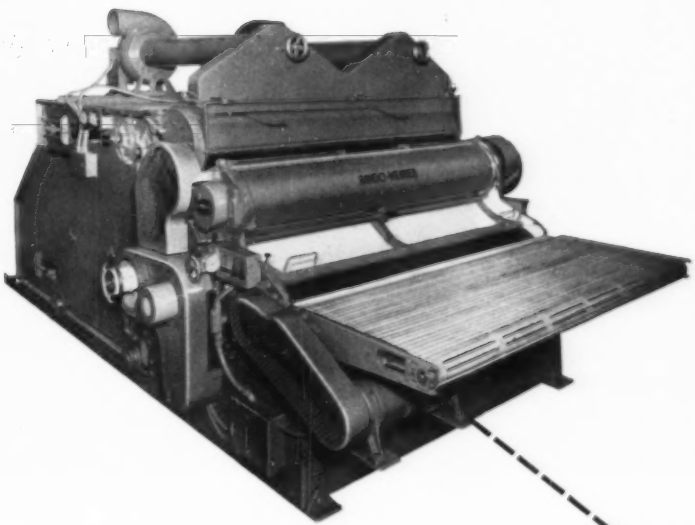
MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, Wayne and Windrim Aves., Philadelphia 44, Pa.

• **REFERENCE DATA: Write for Catalog 2321**

**Honeywell**

First in Controls

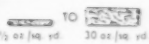
# In the manufacture of Non-wovens, you get the MOST with RANDO-FEEDER® and RANDO-WEBBER®



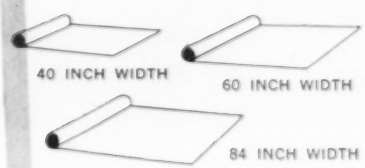
Available in 40", 60" and 84" widths

## LOOK AT THESE ADVANTAGES:

- Equal strength in all directions.
- No waste—at least 98% fiber returned as web
- Low cost raw material
- Stronger webs where delamination is diminished or eliminated. Normally entire web is formed in one layer.
- Flexible—controlled with the turn of a knob.




- Package unit ready to operate with all motors and guards included. Electrical, air, and water connections are all that is required.




3 models for producing random web with square, even selvages.

TEXTILE DIVISION
CURLATOR®
CORPORATION
EAST ROCHESTER, NEW YORK

**WRITE for complete details in Bulletin No. 105. Inquiries invited.**

EXPORT REPRESENTATIVES: Lendt & Company, 535 Fifth Ave., New York 17, N. Y.

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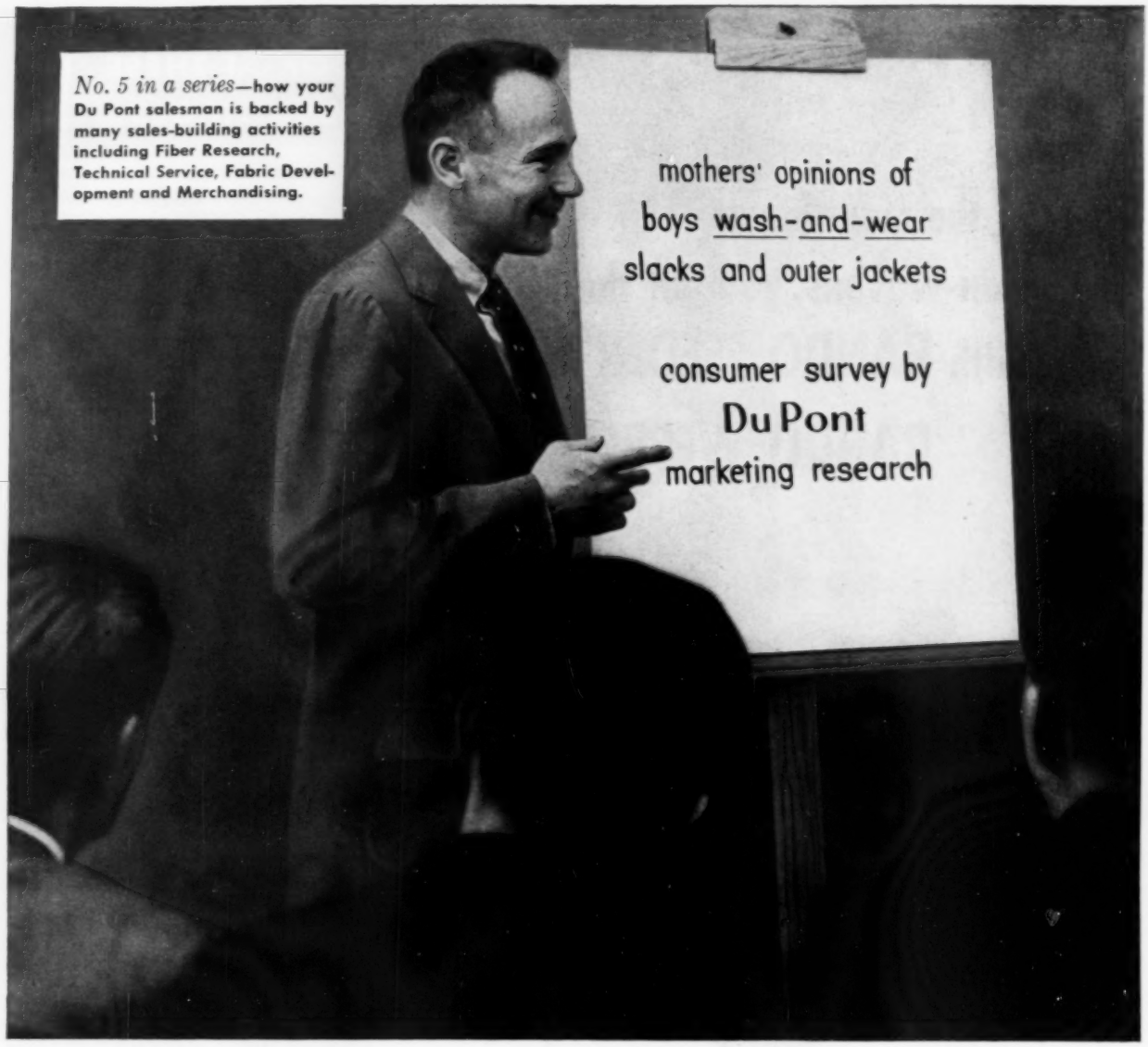
No. 5 in a series—how your Du Pont salesman is backed by many sales-building activities including Fiber Research, Technical Service, Fabric Development and Merchandising.
mothers' opinions of
boys wash-and-wear
slacks and outer jackets
consumer survey by
Du Pont
marketing research

# Marketing research stops guesswork

Here's Dan Colyer, of our Marketing Research Section, presenting the results of a national survey to Gardner Mackinnon, Merchandise Manager, and Charles Chrenko, Boys' Wear Buyer, of Frederick Atkins, Inc.

An important part of Du Pont's Market Research activity is consumer surveys. Their purpose is to (1) define the true potential for our fibers in specific markets; (2) determine effective ways of appealing to consumers. This information is then passed on to interested elements of the textile industry to help them capitalize on opportunities uncovered.

An example is the one being presented in the above photo. Its objective was to determine the consumer appeal of Du Pont fibers in boys' wash and wear slacks and outer jackets and to determine the most effective sales points to use in merchandising this apparel to mothers.

To find the answers, two 3-hour panel sessions were held with 10 mothers who had one or more boys 7-14 years old. From these sessions came a

FROM RAW FIBERS TO RETAIL SALES . . .

## *Product and Process Notes from Du Pont*

**Dyeing "Dacron"*/Cotton by Continuous Process**—The thermosal process for the continuous dyeing of "Dacron" is gaining wider trade acceptance as larger volumes of blends of "Dacron"/cotton are produced. Combined with continuous vat dyeing of the cotton, dyeings of unexcelled fastness can be obtained at speeds comparable to other continuous methods.

**Ondulé Rayon**—Ondulé, a new continuous filament rayon yarn containing randomly spaced, entangled slubs, is now available in 250, 450 and 2200 deniers. The slubs in Ondulé impart to fabrics an unusual resemblance to certain types of silk. This new yarn is expected to become important in draperies, casements, suitings and bedspreads.

**Sewing-Machine Adjustments**—A machine adjustment technique has been developed to provide optimum sewability with threads of Du Pont fibers. The step-by-step, easy-to-follow procedure, which reduces thread breakage and seam puckering, has resulted in significant improvement in sewability as demonstrated on plant equipment. Threads of cotton or Du Pont fibers can be used interchangeably on machines which are so adjusted. This improvement in tailoring technique should broaden new market possibilities for fabrics containing Du Pont fibers.

**Technical Information Bulletins**—These bulletins contain detailed, practical information on Du Pont product and process developments. They cover fiber properties, mill processing, dyeing, finishing and fabrication. Refer to your copies frequently; they can save you time and money. To be sure you have all the bulletins you need—check with your Du Pont salesman or Technical Service representative.

*Du Pont's registered trademark for its polyester fiber.

Enjoy the "Du Pont Show of the Month"—on CBS-TV

# —accentuates selling

questionnaire aimed at finding out mothers' attitudes, motives and purchasing desires in regard to their boys' clothing. This questionnaire was then sent to a national sample of mothers by the Home Testing Institute. One thousand returns were received, tabulated and interpreted.

Among the facts revealed by this survey Du Pont learned—*and is making available* to mills, manufacturers, retailers—that 71% of mothers preferred wash and wear slacks to washable or drycleanable ones. Thus market and selling potentials were defined through factual measurements—providing opportunities for more intelligent planning.

Du Pont believes it can increase the market for its fibers and thus benefit its customers by providing useful assistance to all levels of the textile industry. It's through your Du Pont sales representative that you, as a customer, have access to a range of technical and merchandising information unique in the textile industry.

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

DU PONT BUILDS PROFITS FOR YOU



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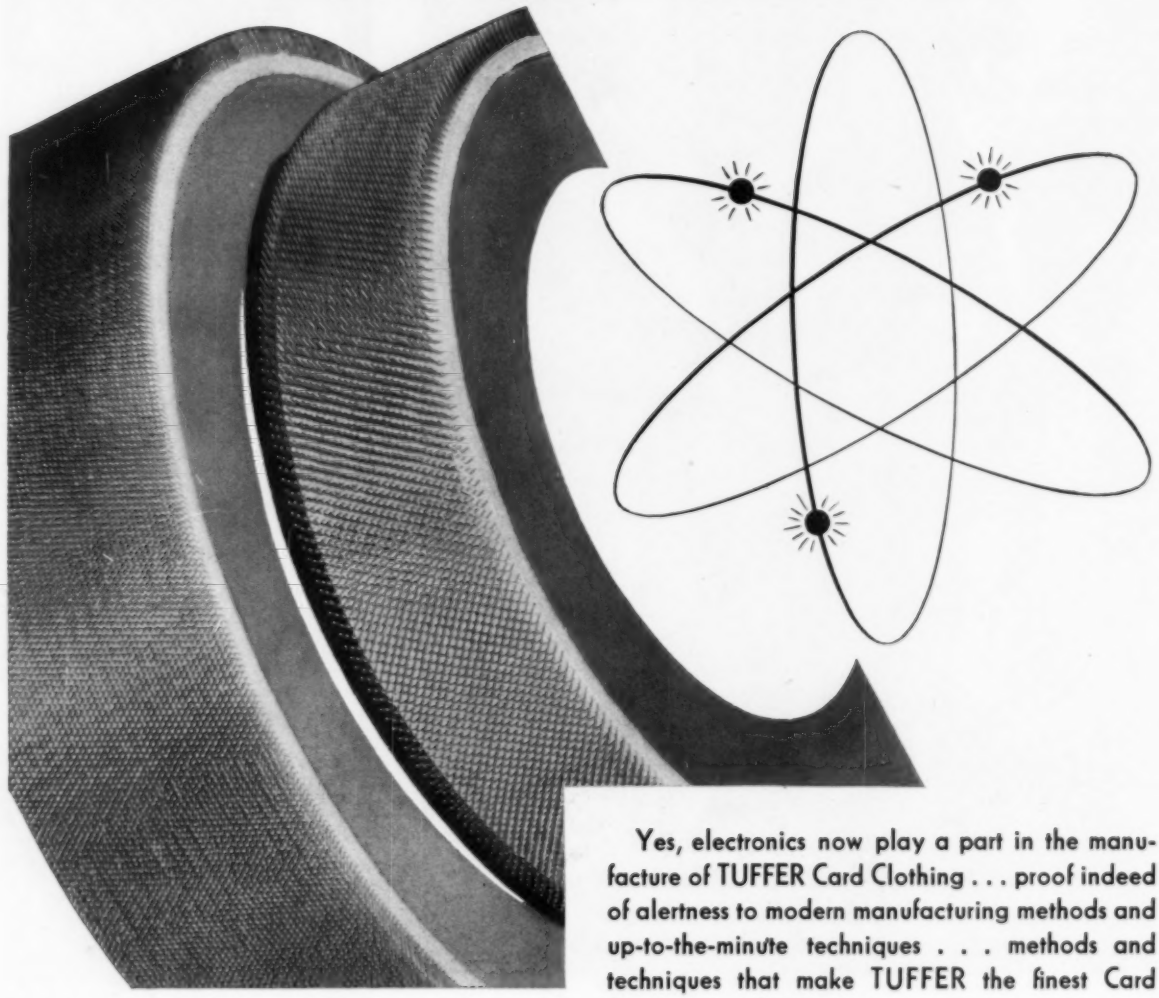
# and now *Electronics* . . .



Yes, electronics now play a part in the manufacture of TUFFER Card Clothing . . . proof indeed of alertness to modern manufacturing methods and up-to-the-minute techniques . . . methods and techniques that make TUFFER the finest Card Clothing available.

Merely keeping abreast of the times, however, is not our only purpose—our constant intensive research is your assurance for even better Card Clothing for TOMORROW.

Howard Bros. forward-looking and progressive manufacturing policy, plus a vital 92 years of experience in the making of Card Clothing, is your guarantee that you are using the very best when you use TUFFER.

B-3

*Manufacturers of Card Clothing since 1866*

Tuffer

## HOWARD BROS.

WORCESTER 8, MASSACHUSETTS

Southern Plants: Atlanta, Ga., Gastonia, N. C., Greenville, S. C.

*Direct Representation in Canada*

**TUFFER PRODUCTS** Card Clothing for Woolen, Worsted, Cotton, Asbestos and Silk Cards • Napper Clothing and Brushes • Top Flats re-covered and extra sets loaned at all Plants • Lickerins rewired at Southern Plants • Hand Stripping Cards



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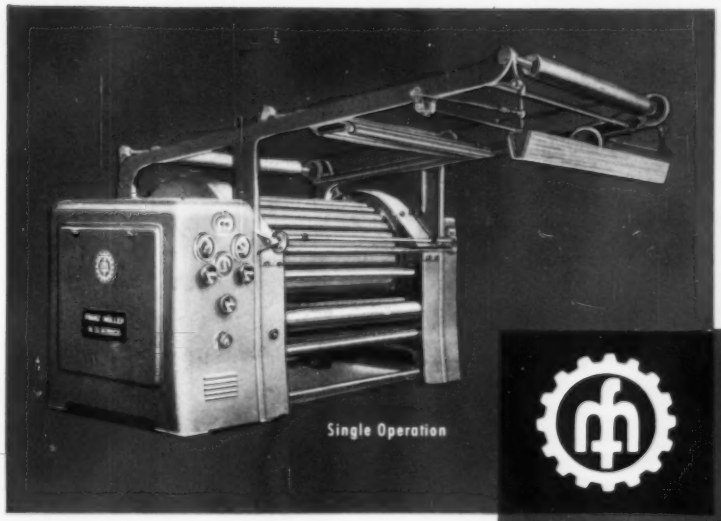
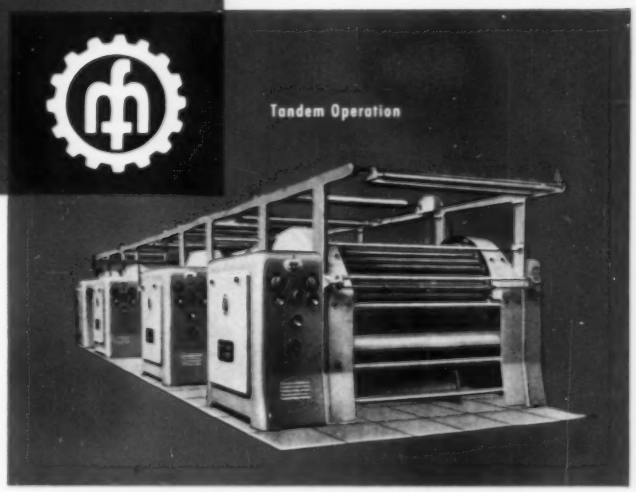
# WHY 80 ? MAYBE 30 ARE SUFFICIENT




THE RESULT
OF 100 YEARS
EXPERIENCE




**30 of these high speed nappers replaced 80 standard nappers in a North Carolina mill**

for reasons of:

- New Processing Methods
- Unequalled Finish
- Highest Production
- Labor Savings

Our agents and service engineers are in the field. Contact them, they'll give you advice.

SOUTHERN U.S.:
PARROTT & BALLENTINE,
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TEXTILE MACHINERY
IMPORT CO.
277 NORTH AVENUE
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COMBITEX
COMBINE OF TEXTILE MACHINERY MANUFACTURERS

**FRANZ MÜLLER • MASCHINENFABRIK • M. GLADBACH (WESTERN GERMANY)**



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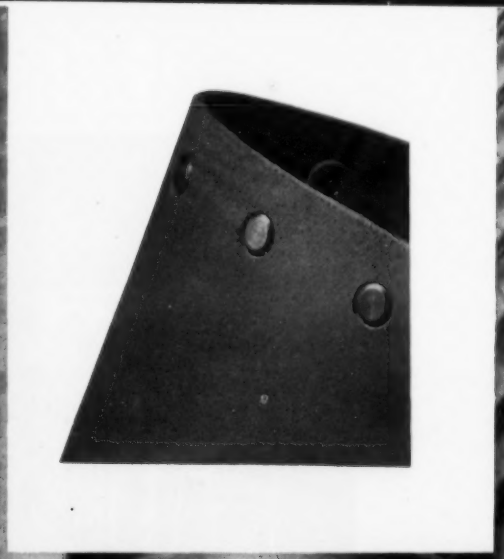


## Tough . . . 2-ply

# Dayco Rub Aprons

## Lower Your Carding Costs

**SAVINGS MOUNT UP** when you figure that Dayco Rub Aprons completely eliminate the cost—at approximately $25.00 an hour—of oiling the aprons when your cards are stripped. And the dimes and quarters you save here and there—because Dayco Rub Aprons need less routine maintenance—soon add up to the cost of the aprons themselves. Besides, what a difference Dayco Rub Aprons make in the quality and uniformity of your yarn!

**LONGER LASTING** Dayco Rub Aprons are doubly reinforced with two plys of tough-rubber impregnated fabric. This extra strength not only gives Dayco Aprons greater stamina under constant flexing . . . it reduces eccentric motion by 33%! Naturally, buttons stay fixed in an apron as tough as this.

**YARN QUALITY** is always consistently high for the texture of Dayco Aprons never varies. Maintaining the highest coefficient of any apron available, Dayco Rub Aprons never become slick or glazed, are immune to changes in temperature and humidity, and are unaffected by emulsion oils which cause *surface growth* in other aprons. As a result, yarn quality never varies—day in, day out, month after month.

**TROUBLE-FREE** Dayco Aprons have an extra-deep synthetic surface which resists the abrasive action of constant rubbing. Since they require no oiling, maintenance is simplified and card downtime virtually eliminated. Nor do Dayco Aprons require frequent adjustment. Perfectly concentric, they hug the rolls tightly for accurate tracking and a positive, non-slip drive at all times.

**DAYCO ENDLESS CONDENSER TAPE**

Features offering additional savings . . . greater card efficiency:

- No stretch—little need for take-ups
- Less tendency to twist or turn over
- Easy to clean—require less attention
- Unaffected by oil or static
- Will not crack, economical, efficient

*Next time he calls, ask your Dayco representative for an estimate of the savings Dayco Rub Aprons can make in your mill. Or write the Dayton Rubber Co., Textile Div., 401 S. C. National Bank Building, Greenville, S. C.*

**Dayton Rubber**

© D. R. 1958

OVERSEAS PLANT, THE DAYTON RUBBER CO. LTD., DUNDEE, SCOTLAND

*Dayco and Thorobred Textile Products for Better Spinning and Weaving*

# 30 ROLL GESSNER HI-TORC NAPPER

Field of napping greatly broadened to include greater range and weight of fabrics

Wide acceptance of Gessner's Hi-Torc principle led to this newest napper

Much more nap in much less time

Greater roll torque available under finger tip control

Machine occupies no more floor area than the now-famous Hi-Torc Napper

Adjustable torque-raising action prevents slipped filling

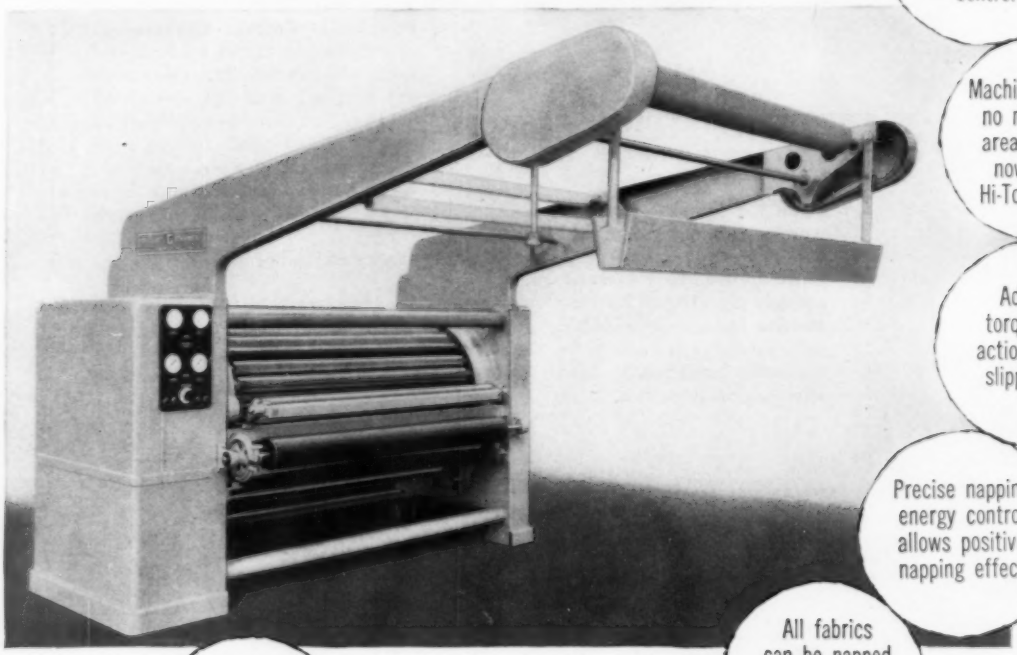
Precise napping energy control allows positive napping effect

All fabrics can be napped with maximum torque raising action

Exact duplication of raising action through hydraulic control system

Breaking, raising and finishing can be done on one machine

Felting action obtained by the simple turn of control knobs.



**DAVID GESSNER CO.**

**WORCESTER, MASS.**

Southern Representative: Richard L. Bernard, 222 Piedmont Bldg., Greensboro, N. C. Western Representative: E. G. Paules & Co., 1762 West Vernon Ave., Los Angeles, California
Canadian Representative: W. J. Westaway, Montreal, Quebec, Hamilton, Ontario

Gessner Improved Cloth Finishing Machines maintain a standard of performance to meet the exact requirements of your cloth finishing.



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# GENACRYL®

# DYES FOR ORLON*

## FOR RICH, FULL SHADES ECONOMICALLY PRODUCED

Sweaters are a necessity in the wardrobes of the younger set. The more colorful, the better. With GDC's Genacryl® dyes, you can match the popular shades shown here or create trend-setting new ones on Orlon, other acrylics, and wool-acrylic mixtures.

Water-soluble Genacryl dyes, a new form of the basic type, are applied directly to the fabric in the presence of acetic acid without numerous complex procedures. Their high tinctorial strength makes possible economical production of bright, full shades that are level and well penetrated. These colors have very good fastness to light, dry-cleaning, perspiration, rubbing and washing.

Write or call our nearest sales office for further information about color-matching formulations and application methods.

*Acrylic fiber of E. I. du Pont de Nemours & Co. (Inc.)

*From Research to Reality*

gdc gaf

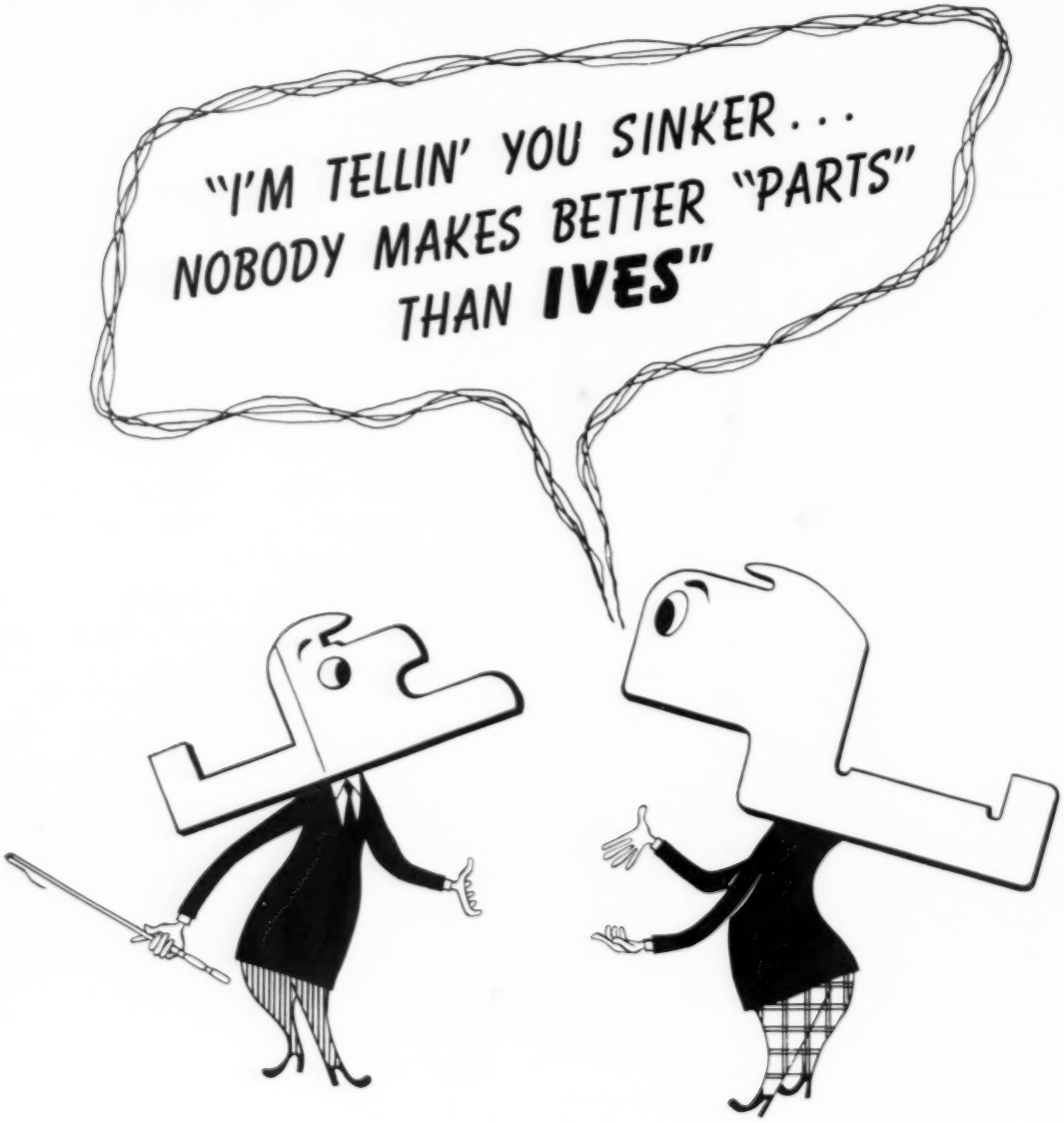
GENERAL DYESTUFF COMPANY

A SALES DIVISION OF

GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

CHARLOTTE • CHATTANOOGA • CHICAGO • LOS ANGELES • NEW YORK • PHILADELPHIA • PORTLAND, ORE. PROVIDENCE • SAN FRANCISCO • IN CANADA: CHEMICAL DEVELOPMENTS OF CANADA, LTD., MONTREAL




## IVES NEEDLES AND PARTS,

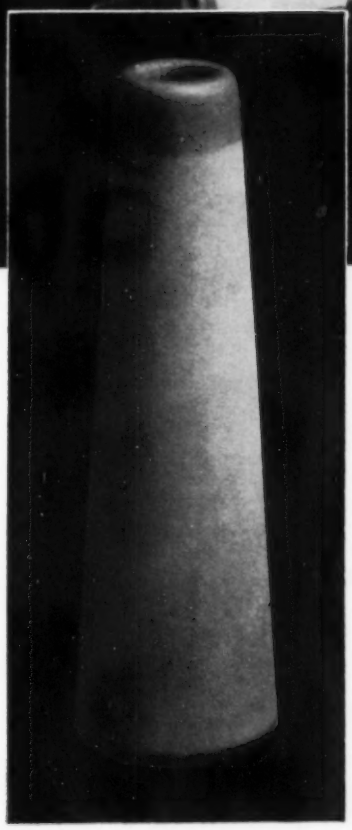
are exactly engineered and precision manufactured for all types of knitting machines. All IVES needles and parts are smoother and specially hardened and tempered of longer wearing Vanadium steel. When you're asked about needles, sinkers, sliders or replacement knitting parts insist on IVES. . .
86 years in-the-mill on-the-job performance backs your judgment.

*Write, wire or phone CHarter 9-0396*

**THE LOYAL T. IVES CO., INC.**

**NEW BRUNSWICK, N.J.**

# Decrease Downtime WITH SONOCO-RESEARCHED PRODUCTS



There is nothing that cuts deeper into profits than downtime . . . and here's how SONOCO-researched carriers keep downtime to a minimum.

All SONOCO cones represent exhaustive research and development. They are made to accept and deliver yarn smoothly. Downtime, resulting from the carrier, is practically eliminated.

The SONOCO 3°30′ cone, as shown, is a typical example. It is job-engineered especially for winding rayon, nylon and other filament yarns.

SONOCO is the one company in its field that, for nearly 60 years, has supplied the industry with research-developed paper carriers. For you, SONOCO products mean better performance, greater economy and more profitable production!

# SONOCO

## Products for Textiles

**SONOCO PRODUCTS COMPANY**

*Main Office*—HARTSVILLE, S. C. • MYSTIC, CONN. • AKRON, IND. • LOWELL, MASS. • PHILLIPSBURG, N. J. • LONGVIEW, TEXAS • PHILADELPHIA, PA. • LA PUENTE, CAL. • ATLANTA, GA. • GRANBY, QUEBEC • BRANTFORD, ONTARIO • MEXICO, D. F.

1303

# Geared to the needs of every textile market

**ARNEL** the new triacetate fiber for easy-to-care-for lingerie and apparel.

**ACETATE** the beauty fiber for elegant dress fabrics, sportswear, men's apparel, home furnishings, umbrellas and lampshades.

**CELACLOUD** the pure-white acetate staple fiber specially engineered for hygienic mattresses, mattress pads, sleeping bags, and upholstered furniture. Ideal outerwear batting too.

**CELAFIL** the white, light and resilient acetate staple fiber exclusively designed for sleeping pillows and comforters.

**TYPE HC ACETATE** the new high crimp carpet acetate staple fiber is tops in tufts; can be permanently heat set, cross-dyed beautifully, processed on cotton systems.

**CELAPERM** the filament acetate yarn with "sealed-in" color for bathing suits, shirtings, sportswear, children's clothes, other apparel and home furnishings.

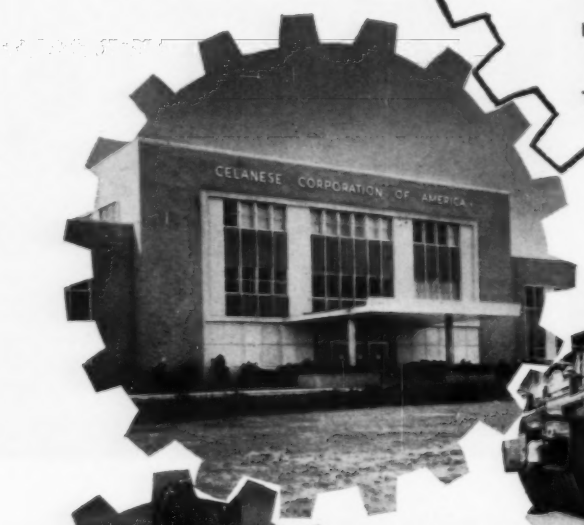
**BULKED CELAPERM** the new bulked filament acetate yarn brings a lofted look to home furnishings, upholstery and floor covering fabrics, plus apparel for all.

**QUILTICEL** the permanently bonded acetate batting for interlining holds its shape in all quilted outerwear, loungewear, and infants' wear.

**FORTISAN** the fine denier rayon for home furnishing sheers; adds beauty and stability to decorative fabrics.

**FORTISAN-36** high strength heavy denier filament rayon specifically engineered for industrial uses such as high pressure hose, V-belts, tarpaulins, etc.

**TYPE-F ACETATE** the new modified cross-section filament acetate that provides added luxury and elegance in draperies.



Engineered to deliver specific virtues to specific end-uses, these are "fibers without headaches," easy and economical in production, certain in performance.

They are the product of industry's most extensive fiber and fabric development program—extending from unparalleled research facilities in Charlotte, N. C., to consumer testing the country over. They are quality controlled fibers geared to today's and tomorrow's markets—part of Celanese continuing resolve to meet modern needs with truly contemporary fibers.

Celanese Corporation of America,
Textile Sales Division, Charlotte, N. C.

*District Sales Offices:* 180 Madison Ave., N. Y. 16.
Room 10-141 Merchandise Mart, Chicago 54, Ill.
200 Boylston St., Chestnut Hill 67, Mass.
819 Santee St., Los Angeles, Calif.

*Export:* Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Ave., New York 16, N. Y.

Celanese® Arnel® Celaperm® Fortisan® Quilticel®
Celacloud™ Celafil™

**From the industry's most modern research and development plants and programs come**

**Celanese contemporary fibers**



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Nacconol® SL
LIQUID DETERGENT
MOST OUTSTANDING DETERGENT in the TEXTILE INDUSTRY
Nacconol SL, liquid, gives you more cleaning power per dollar on an active ingredient basis as compared with most dry products.
It's cleaner and easier to handle, requires no dissolving. Cuts production costs!
Other features: Excellent foaming, very low haze-point, low salt content. Emulsifies grease and oil. Compatible with anionic and non-ionic materials. Needs no extra stabilizer.
For samples, price and delivery quotations, call the nearest National Aniline office today.
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Greensboro Los Angeles New Orleans Philadelphia Portland, Ore. Providence San Francisco Toronto
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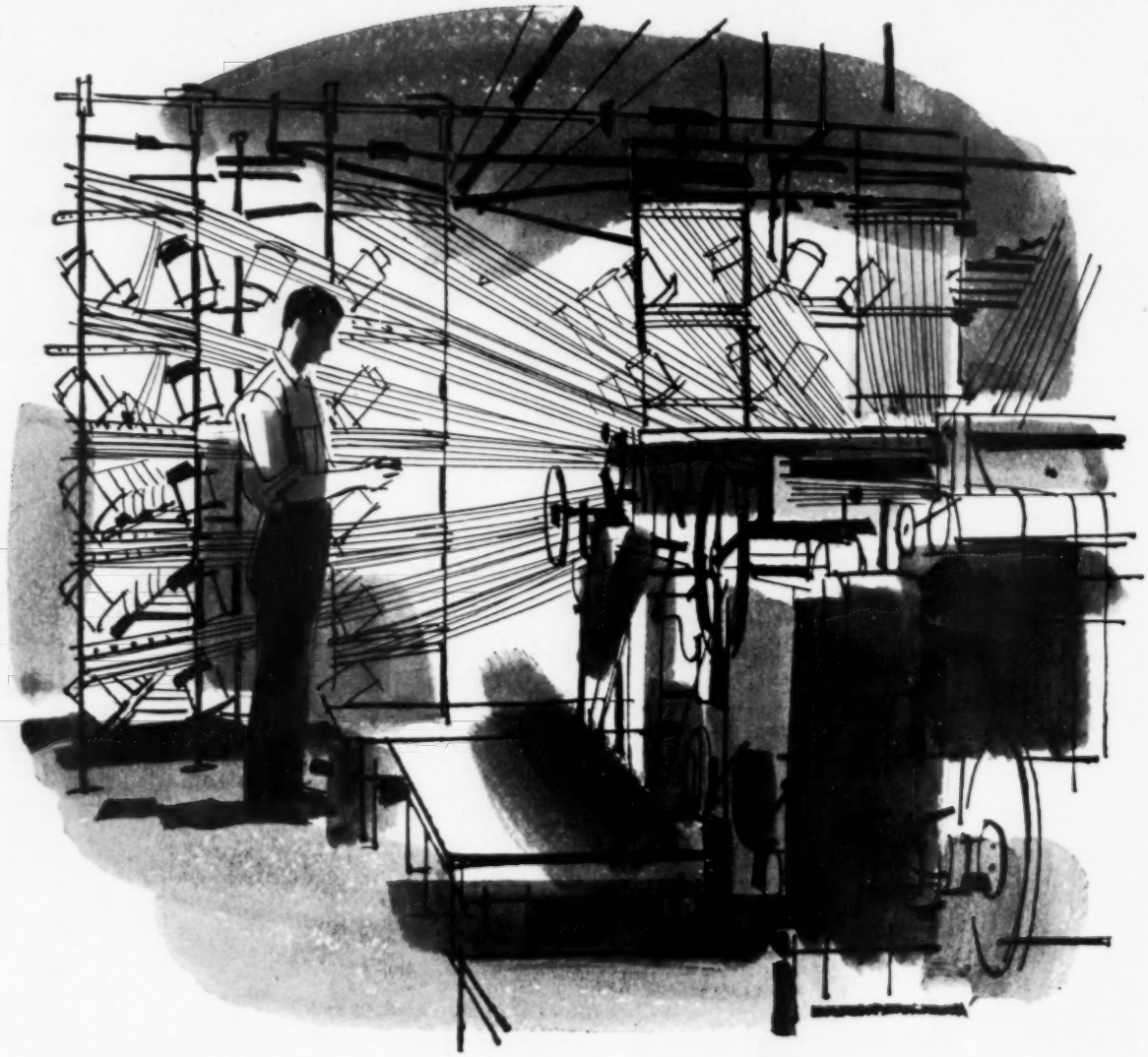

Nowhere in the textile industry can your mill problems be solved more realistically and effectively than in American Viscose Corporation's TTSD*. This is a priceless plus you get with Avisco® fibers or yarns, and you pay no more for it.

*Here in our Technical and Textile Service Department we use actual mill machinery under mill operating conditions. With such complete facilities, we can start with the fiber, open it, card it, spin it, weave it, dye and finish it. Or starting with the yarn, we can beam it or twist it, weave it or knit it, dye it and finish it. What works here will work in your mill, too.

AVISCO

This assistance is as near as your phone. Call LA 4-7200 or write American Viscose Corp., 350 Fifth Ave., New York 1, N. Y.



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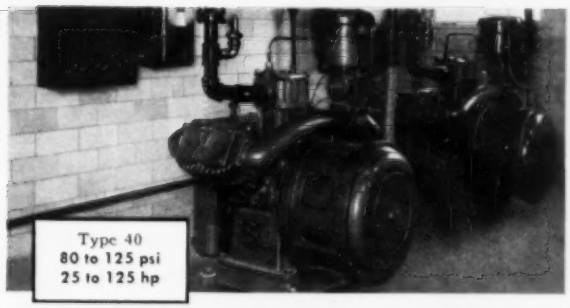
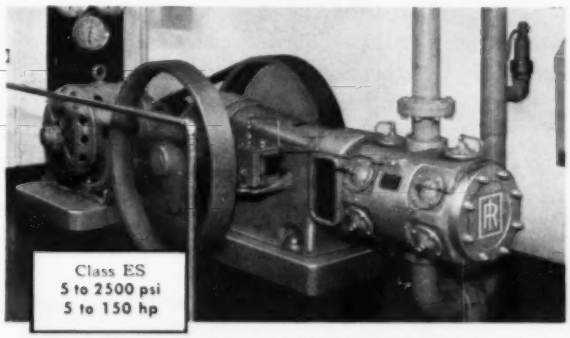
# You can always depend on I-R compressors for real economy




High-capacity, two-stage compressors with air-cooled cylinders and intercoolers, available with three types of electric motor drive: V-belt, flexible coupling and unit type with compressor and motor on common shaft. All units are highly efficient, compact and light in weight.

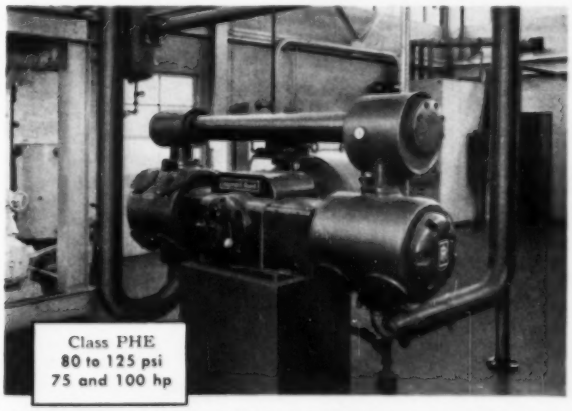



Heavy-duty units with one, two and three stages—arranged for electric motor or steam drive. These double-acting, horizontal, crosshead-type compressors, with Channel Valves and water-cooled cylinders, are built for continuous full-load service under severe operating conditions.

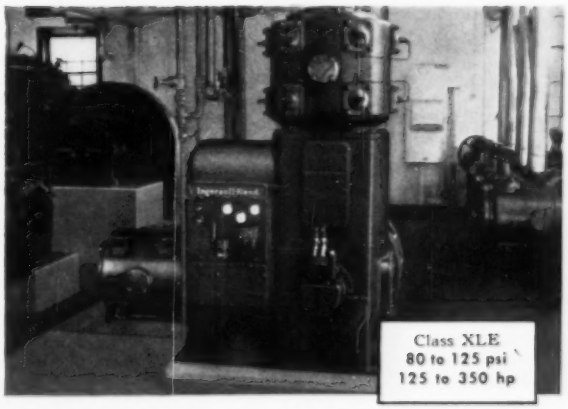
- *Efficient operation*
- *Low maintenance costs*
- *Easy installation*

Whatever your compressed air requirements, there's an Ingersoll-Rand compressor that's *right* for the job. Because mechanical and compression efficiencies are high, the unit will deliver full rated output with consistently low power requirements. With its rugged, dependable construction, the I-R compressor will stay on the job longer, with less time out for maintenance.

You can be sure of receiving real economy from *any* Ingersoll-Rand compressor . . . a machine that is economical to install, run and maintain. Contact your nearest I-R branch for complete information.

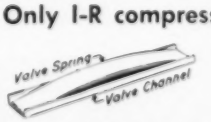



Opposed-cylinder, balanced-design, two-stage compressors with water-cooled cylinders and built-in motor. There are no adjustments within the sealed frame. Full-floating aluminum bearings have extremely long life. Channel Valves are highly efficient. A completely packaged unit.




Heavy-duty, double-acting, two-stage, water-cooled compressors, featuring a completely new "L" design which makes the XLE simple, compact, accessible and economical. Pipeless, Thru-Frame Air Flow, Packaged intercooler and built-in electric motor save space—reduce installation, power and maintenance costs.

**Only I-R compressors have CHANNEL VALVES**




Known for high efficiency, quiet operation and exceptional durability. Entirely different. Each valve assembly is a combination of rigid stainless-steel channels and springs, with trapped-air spaces which cushion action.

OTHER TYPES AND SIZES . . . TO 6000 HP

**Ingersoll-Rand**

1-389 11 BROADWAY, NEW YORK 4, N. Y.



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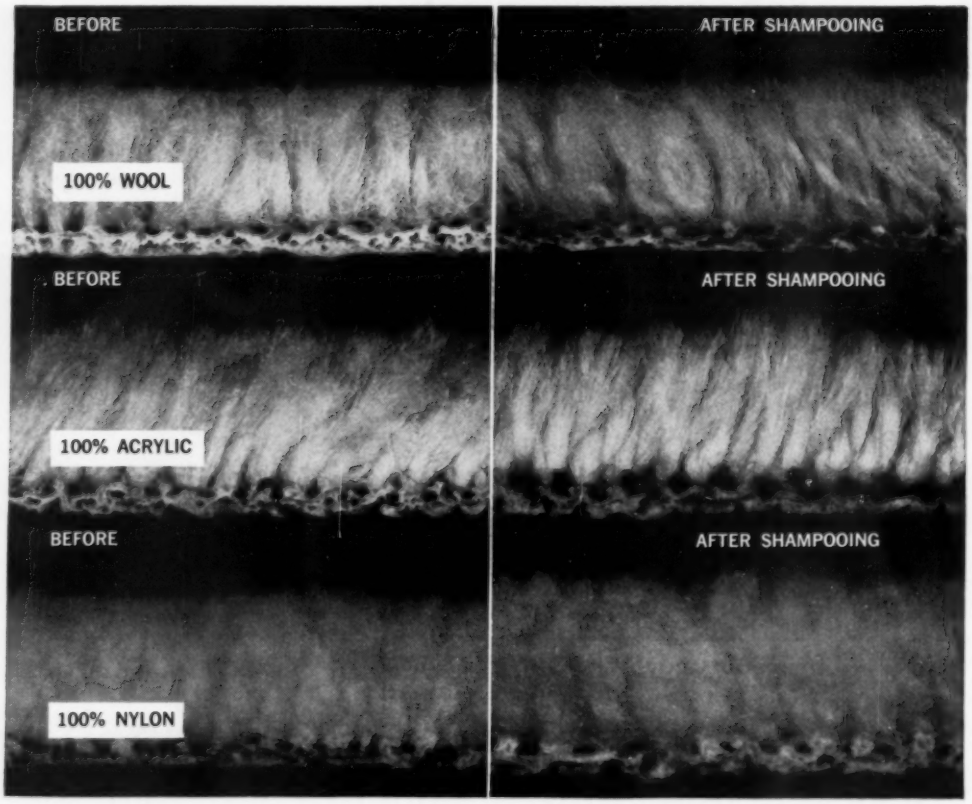
# texture retention of Nylon is superior and permanent

Three separate and distinct tests are shown here. Within each test, photos show identical (except for fiber content) strips of carpeting before and after shampooing. You will note that the texture of nylon is virtually unchanged even though it has been subjected to this treatment *10* times with rotary brush action. 100% wool, rayon and acrylic have lost considerable texture. The addition of respectable percentages of nylon produces fabrics which stand up extraordinarily well, but not as well as 100% nylon.

## TEST NO. 1...NYLON COMPARED WITH WOOL AND ACRYLIC

*CUT PILE, NOT TWIST-SET*



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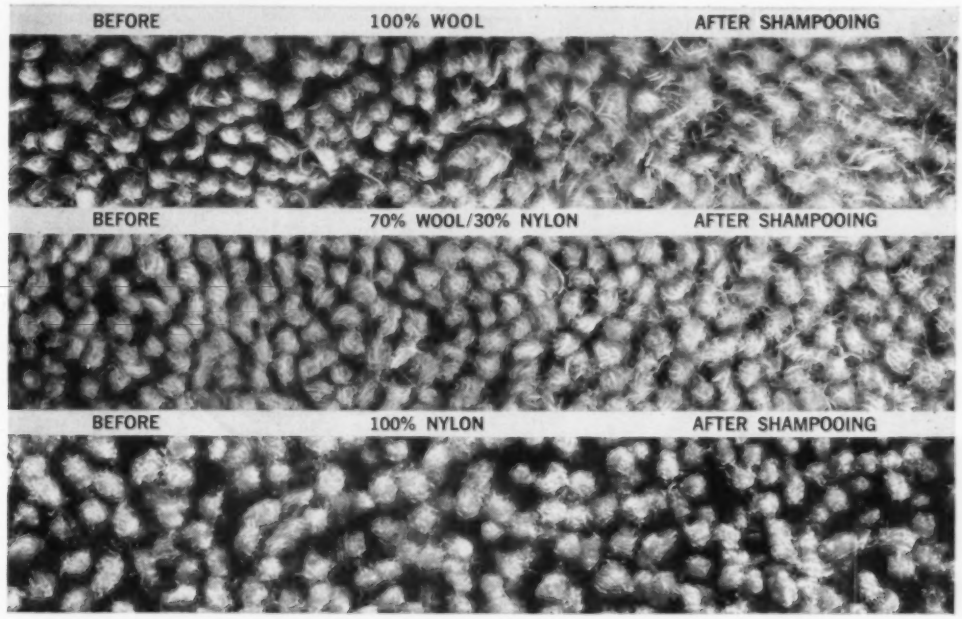
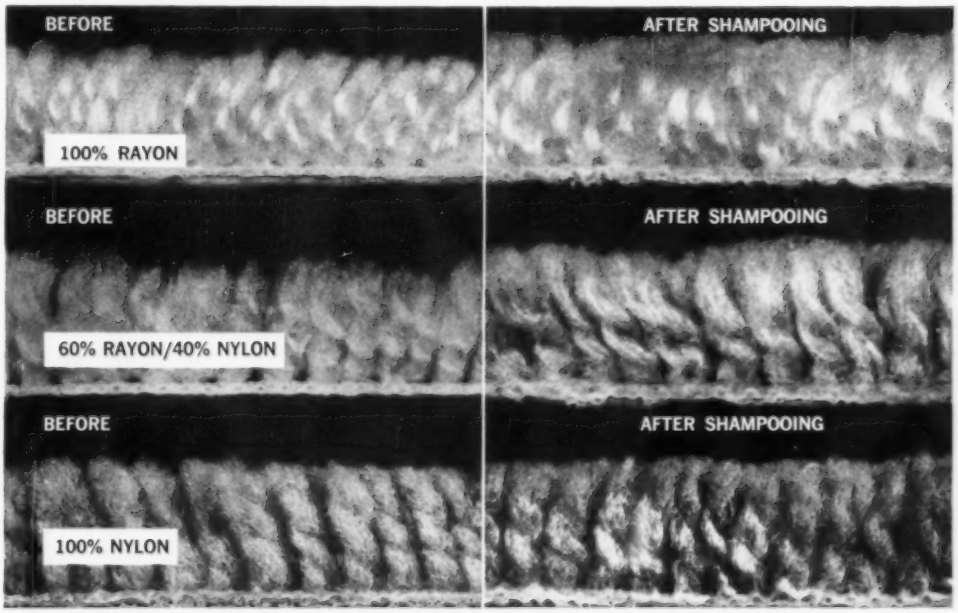
## ▶▶TEST NO. 2...NYLON COMPARED WITH WOOL

*CUT PILE, TWIST-SET*




## ▶▶▶TEST NO. 3...NYLON COMPARED WITH RAYON

*CUT PILE, NOT TWIST-SET*




THE NEW Nylon Staple I·R·C

**INDUSTRIAL RAYON CORPORATION,** 500 Fifth Avenue, New York 36, New York · 627 Guilford Building, Greensboro, North Carolina



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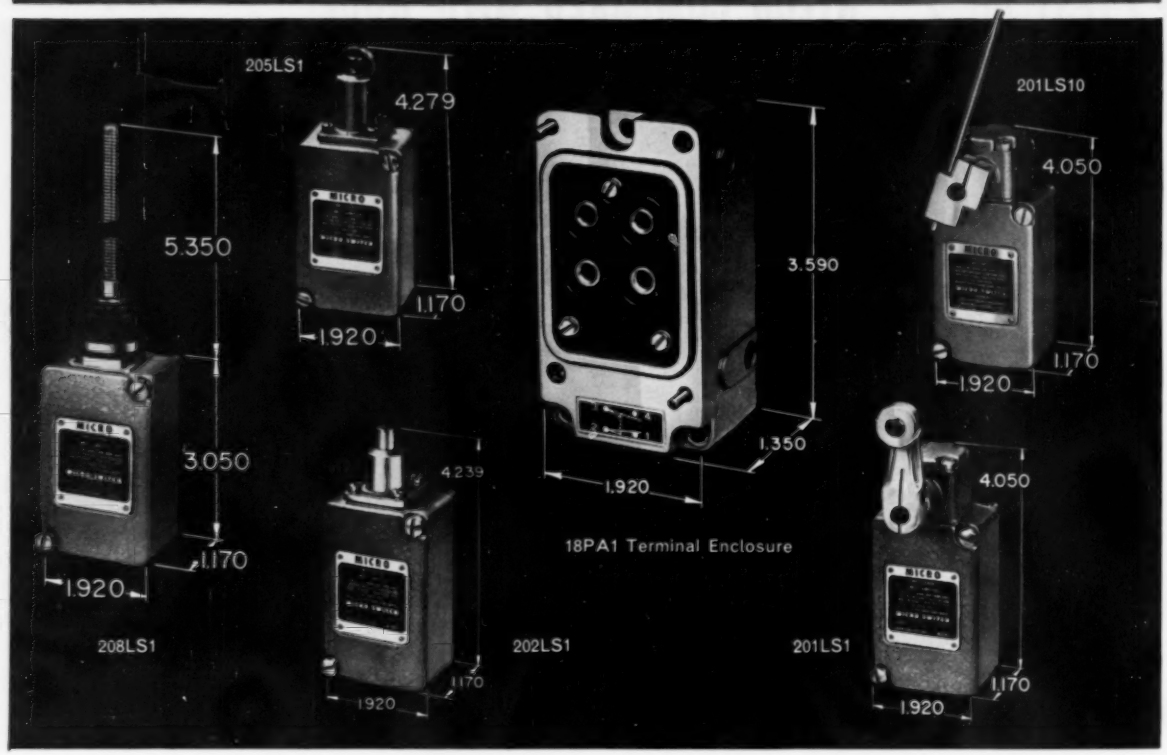
# MICRO SWITCH Precision Switches




## This NEW MICRO SWITCH "Plug-in Limit" Switch cuts downtime to 20 seconds

The new MICRO SWITCH "Plug-in Limit" Switch plugs in like a radio tube and can be replaced in seconds.

It offers all the features of rugged construction and precision long-life operation, so necessary in a limit switch. The assembly of the terminal block and switching unit comprise a complete switch thoroughly sealed against cutting oils, chips, dirt and dust. The "200LS" series switches meet NEMA standards.

The switch enclosure, including all moving mechanical and electrical parts, is plugged into the terminal block, precisely positioned by means of dowel pins. Under normal conditions the terminal enclosure need never be removed from the machine.

**18PA1 Terminal Enclosure** — This enclosure is common to all actuator assemblies in the "200LS" series. Can be mounted from front, back or either side. All switch enclosures illustrated above fit this terminal enclosure. Two No. 10 captive screws secure the two enclosures together.

**208LS1 Coil Spring Actuator** — flexible spring actuator for multi-direction operating motion.

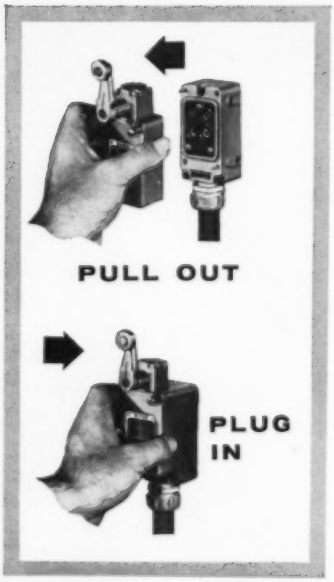
**205LS1 Roller Plunger Actuator** — adjustable at 90° angles.

**202LS1 Push Plunger Actuator** — for in-line actuating motion.

**201LS10 Rod Actuator** — provides light actuating force. See adjustability details under 201LS1 below.

**201LS1 Roller Arm Actuator** — field adjustable for actuation in either clockwise or counter-clockwise, or in both directions. Arm is adjustable through 360° Actuating head can be faced in any of four directions.

For details of the "200LS" series, send for Bulletin No. 20.




*The two-word name "MICRO SWITCH" is NOT a generic term. It is the name of a division of Minneapolis-Honeywell Regulator Company.*

**MICRO SWITCH**

A DIVISION OF MINNEAPOLIS-HONEYWELL REGULATOR COMPANY

In Canada, Leaside, Toronto 17, Ontario • FREEPORT, ILLINOIS

*First in Precision Switching*



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# Whitin Spinning Changeovers

A recent installation of Whitin Spinning Changeovers

## . . . the *SMART* way to stay COMPETITIVE

The Whitin 2-apron drafting system with over 12,000,000 spindles sold, has become an industry by-word; its performance has created standards by which other systems are judged. Today's Whitin SUPER-DRAFT® which is now available as a Changeover on standard spinning frames, provides you not only with superb fiber control but also will operate on drafts up to 50 (or even higher) with no loss in yarn strength or quality.

While applying Whitin Super-Draft Changeovers, more and more mills grasp the opportunity to equip their frames with UNITROL®, Whitin's distinctive top arm weighting system. Unitrol supplements the performance of the Super-Draft system by insuring accurate, uniform weighting on all rolls while supplying Whitin antifriction front top rolls and non-lubricated middle and back rolls.

Mills using this combination of changeover units are enjoying such direct spinning benefits as reductions of 20 to 30% in end breakage and 30 to 40% in cleaning costs coupled with improved production per operator.

Call your Whitin Sales Engineer today! Ask him to look over your mill situation—he'll appreciate the opportunity of showing you how Whitin Spinning Changeovers can help you to stay competitive — the smart way.

*Buy "competition insurance"- BUY WHITIN!*

**Whitin MACHINE WORKS**

WHITINSVILLE, MASSACHUSETTS

CHARLOTTE, N. C. • GREENSBORO, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.



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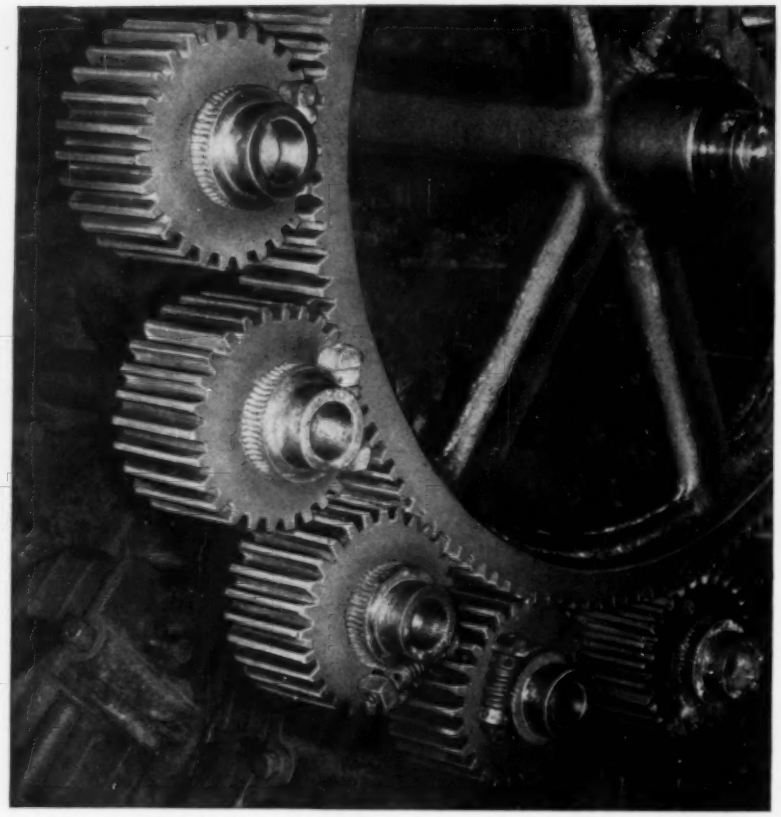
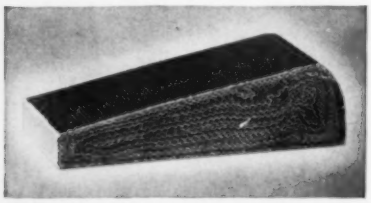


**REDUCE WEAR** on large metal gears and reduce noise in textile printing machines with the use of C-D-F Celoron plastic gears. Prior to this use of Celoron, metal gears had to be replaced after one to two months' operations. Since installing nine C-D-F Celoron gears over a year ago, there has been no wear on the main gear, no replacement of the C-D-F Celoron gears.

**ELIMINATE CORROSION,** resist wear with C-D-F Celoron pot-eyes for bleachery applications. This low-cost molded product is extremely smooth and strong, has excellent resistance to high heat, moisture, abrasion.



**INCREASE MACHINE EFFICIENCY** with special C-D-F loom parts. This C-D-F parallel plug has high impact strength, is impervious to oil and water. It does not fracture, chip, delaminate. Two years' life is common.

**SAVE MATERIALS** with superior C-D-F Roving Cans. For running synthetics, C-D-F makes a rolled fibre rim that eliminates static charge. No chance of snagging or injuring materials. New 15" diameter Diamond Fibre cans are now available!

# LOWER mill operating COSTS by wider use of C-D-F plastics

Reduce wear and noise, eliminate corrosion, increase machine efficiency, save materials. That's what these four examples of C-D-F plastics can do for your mill. C-D-F is a leading manufacturer of vulcanized fibre, the long-life material that goes into Diamond Fibre Roving Cans which are famous for quality and their seamless uniformity. C-D-F has years of experience in selling the textile industry, has established its southern headquarters in Spartanburg, S. C. Reasonable prices, superior quality, fast service are part of every order placed with the friendly C-D-F textile sales engineer. If lowering mill operating costs is your responsibility, C-D-F . . . a big reliable source of supply . . . helps you with a complete line of textile industry plastics.

## C-D-F MAKES

**BARRELS**
**BEARINGS**—cloth roll, jig
**BOARDS**—examining
**BOBBINS**
**BLADES**—separator
**BOXES**—battery filling
bobbin
conditioning
doff
mill
quill
spooler
tote
**BUSHINGS**—binder
**CAMS**
**CANS**—roving waste
**COUPLINGS**
**COVERS**
spinning bucket
**GEARS**—auxiliary
card
coiler head
fitting
motor pinion
quill
picker
spinner
spooler
**GUIDES**—knife
**PICKER**—stick parts
**PINS**—binder
**PIRNS**
**PLATES**—lay
**PLUGS**—parallel
**POT**—eyes
**PULLEYS**
**RECEPTACLES**
**ROLLS**—lap
**ROLLERS**
**SEPARATORS**
**SHEETS**—bin lining
**SHUTTLE PARTS**
**TABS**—binder
**TRACK**—tenter frame
**TRUCKS**—cloth
conditioning
doff
filling
quill
spinning
spooler
twisting
waste
winding
**TUBES**—core sizing
**TUBING**—spiral
**WASHERS**

**CALL C-D-F SPARTANBURG, Spartanburg 3-6397 for fast service, expert technical help.**

CDF

## CONTINENTAL-DIAMOND FIBRE

A SUBSIDIARY OF THE Bruhl COMPANY, INC.

NEWARK 55, DELAWARE



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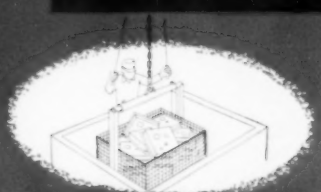
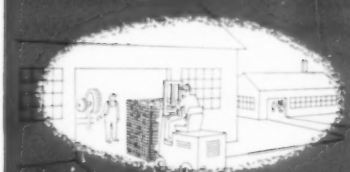
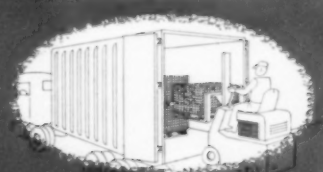
# Wherever you handle materials . . . *there's a need for* CARGOTAINERS®






On production lines; in processing operations; in storage and warehousing; in shipping or in inter-plant materials moving—CARGOTAINERS answer many of your materials handling problems.

CARGOTAINERS are available in Clearview and Strip Base models, each in several sizes and capacities. Optional features include full or partial drop ends and sides; crane eyes; vertical and horizontal dividers. There is a CARGOTAINER which will exactly meet the requirements of virtually every application.

All models and types fold compactly when not in use, thus saving storage space and also cutting return cost when they are used as shipping containers.

CARGOTAINERS are made of heavy gauge steel wire, and coated with pre-heated, corrosion-resistant vinyl aluminum paint. They are light in weight but strong and rugged for dependable, maintenance-free service year after year, even under exceptionally severe conditions.

Standard capacities are 2,000, 3,000, 4,000 and 6,000 pounds; standard sizes 32″ x 40″ x 24″, 32″ x 40″ x 28″ (3,000 lb. cap.), 36″ x 46″ x 24″, 40″ x 48″ x 24″ and 48″ x 48″ x 24″.

Our new catalog gives full information on CARGOTAINERS, and also on Tri-State Pallets and Tri-State Conveyor Guard. May we send you a copy?

## CARGOTAINER DIVISION

**TRI-STATE ENGINEERING COMPANY**

Washington, Pennsylvania

MEMBER



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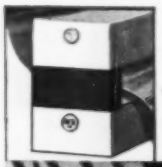


...GATEWAY TO SAFETY FROM TRAMP METAL

## "Piles of Grief" that could have been prevented with the RCA Metal Detector!

Textile mills frequently report tremendous losses caused by tramp metal. Don't let such a "nightmare" threaten your production profits! Automatically, the RCA Metal Detector specially designed for textile mills, finds hidden metal particles of all types—both magnetic and non-magnetic—even though they are woven or knit into the cloth. And, to be detected, the metal needn't be any bigger than the dot at the end of this sentence.

Used on strip material traveling at speeds from 15 to 1000 ft. per min., with full inspection sensitivity, the RCA Electronic Metal Detector can be arranged to sound an alarm, and/or stop the traveling material. It can pay for itself quickly, many times over through savings in product, decreased downtime, and longer life of costly machinery.

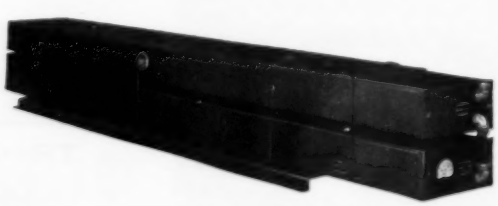
*Find out today how the RCA Metal Detector can save you money. Write for latest literature, RCA, Dept. D-140, Building 15-1, Camden, N.J.*

RCA Tmk(s) ®

**RADIO CORPORATION of AMERICA**

CAMDEN, N. J.

In Canada: RCA VICTOR Company, Limited, Montreal



RCA ELECTRONIC METAL DETECTOR



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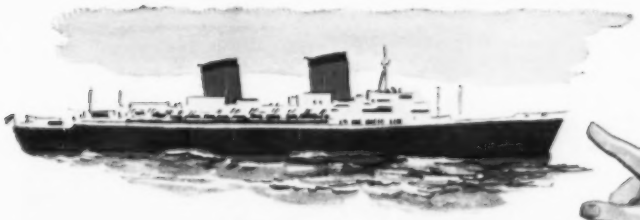
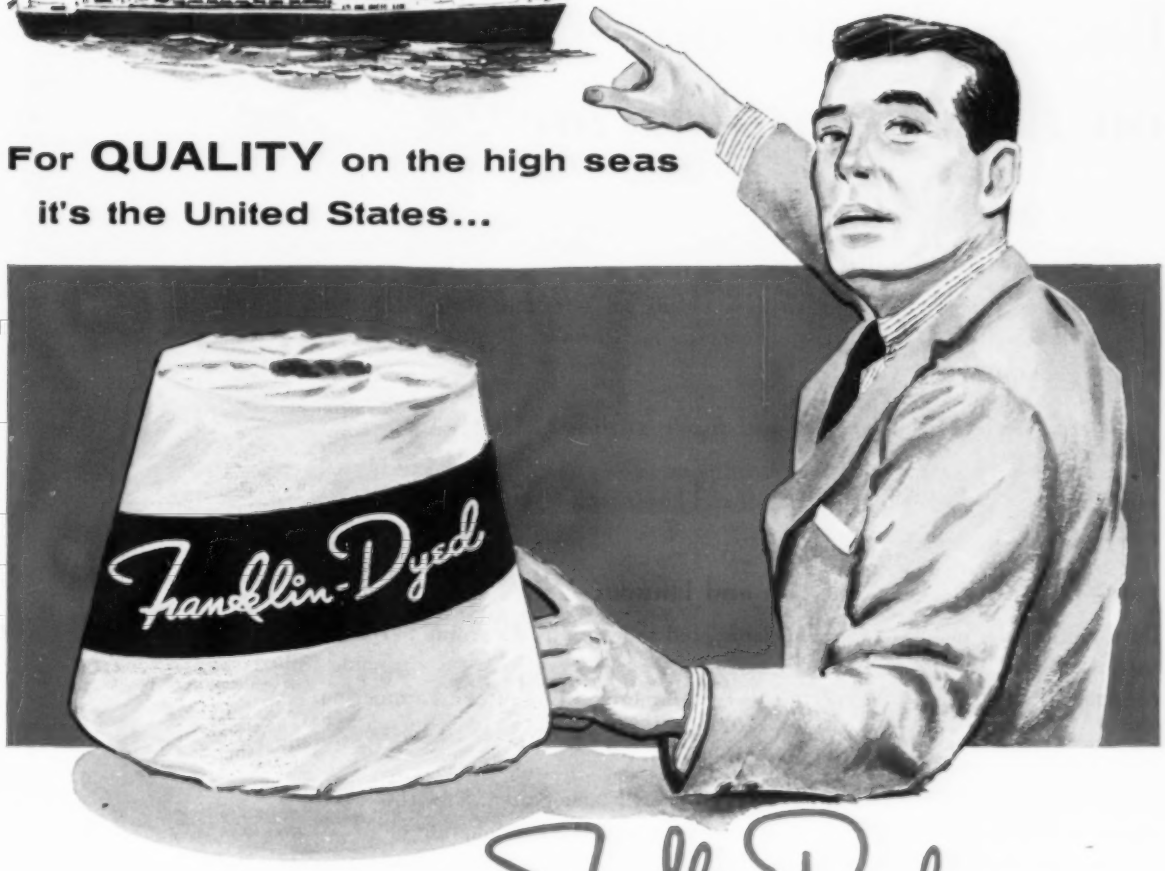


# For QUALITY on the high seas it's the United States...




## in colored yarns it's Franklin-Dyed

Uniformity is a hallmark of "Franklin Dyed" quality. We dye yarns exclusively on the Franklin compressible spring. This permits uniform density of packages, which promotes uniform penetration of the dye liquor. Uniform penetration yields uniform shades. And uniform shades put your end products in the quality class.

### SPECIALIZATION

Yarn dyeing is our specialty. We don't dye to make yarn sales. Our 5 plants and our entire organization have but one objective — to provide the best yarn dyeing service available.

### CAPACITY

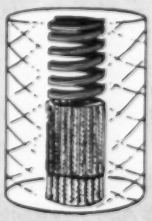
With 5 dye plants, hundreds of package dyeing machines in dozens of sizes and winding equipment to match, we are literally the largest package dyers in the world — ready to dye all types of spun fibres in any quantity.

### CONSULTATION

We can help you with your color problems. We have unequalled experience in time, variety and volume — all at your service.

### AVAILABILITY

Our 5 yarn dyeing plants, strategically located in 5 different textile centers, are conveniently yours. Contact our nearest plant or office.



**X-ray view of Franklin Package, the "secret" of uniform shades. Don't say "package dyed". Say "Franklin-Dyed".**

**Franklin Process**

**A DIVISION OF INDIAN HEAD MILLS**

Dyers of cotton (carded, combed, mercerized) Orlon* (yarn & tow) Acrilan • Dacron** • Ban-Lon® • Helanca • Spun Nylon • Spun Rayon • Blends • Wool and Worsted yarn

Providence • Philadelphia • Greenville
Chattanooga • Fingerville, S. C.
New York Office — 280 Madison Avenue

*Trademark for Dupont's acrylic fibre
**Trademark for Dupont's polyester fibre



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# Do you know the "yes" and "no" score on *Lurex®-with-Mylar*?*

| | Yes | No |
|---|---|---|
| **Is Mylar itself a metallic yarn?** | ☐ | ☑ |

Mylar in itself is *not* a metallic yarn. It is a clear polyester film made by DuPont. When combined with Lurex it then becomes a metallic yarn known as Lurex-with-Mylar.

| | Yes | No |
|---|---|---|
| **Is Lurex-with-Mylar softer and more supple?** | ☑ | ☐ |

Dobeckmun has long experience in creating metallic yarns that are superbly soft and supple. Lurex itself is exceptionally soft and Lurex-with-Mylar is an outstanding development in this field.

| | Yes | No |
|---|---|---|
| **Does Lurex-with-Mylar clean and launder well?** | ☑ | ☐ |

Lurex-with-Mylar may be cleaned or laundered successfully according to the fiber with which it is woven. In itself, Lurex-with-Mylar is completely dry cleanable and commercially launderable. As certified by the American Institute of Laundering.

| | Yes | No |
|---|---|---|
| **Has Lurex-with-Mylar greater brilliance?** | ☑ | ☐ |

The non-tarnishing brilliance of Lurex is universally recognized. Now this high degree of brilliance is even further increased through the combination of crystal-clear Mylar with Lurex.

| | Yes | No |
|---|---|---|
| **Lurex-with-Mylar offers maximum strength with delicacy?** | ☑ | ☐ |

The strength of Lurex is remarkable, especially in view of its delicacy. In Lurex-with-Mylar the delicacy is maintained and the strength is greatly increased.

| | Yes | No |
|---|---|---|
| **Lurex-with-Mylar has outstanding heat resistance?** | ☑ | ☐ |

Mylar, used in combination with Lurex, permits the application of standard wet processing procedures with successful results . . . provides heat, abrasion and chemical resistance.

| | Yes | No |
|---|---|---|
| **Has Lurex-with-Mylar greater design versatility?** | ☑ | ☐ |

The unique combination of properties in Lurex-with-Mylar plus the tremendous color range of Lurex itself offers exceptional scope for design.

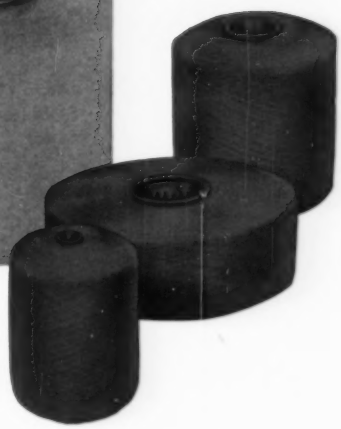
**Lurex-with-Mylar gives you the advantage of the name your customers know, the name that is backed by consistent national advertising and strong local promotion.**

*The Dobeckmun Company, A Division of The Dow Chemical Company, Cleveland • New York • London • Amsterdam*

Atlanta • Berkeley, Calif. • Boston • Philadelphia • Charlotte, N. C. • Chicago • Detroit
Manufacturing Affiliates in Canada: William B. Stewart & Sons Ltd., Toronto and Montreal

*T. M. du Pont

Modern Turbo Smith-Drum Package Dyeing Equipment in the new Coats & Clark plant at Toccoa, Ga.



# Modern Mill . . .
# EFFICIENT PRODUCTION
# . . . Modern Smith-Drum Dyeing Equipment

Smith-Drum leads the field in high-temperature, high pressure dyeing equipment. Here are a few reasons:

— A sample-package-kier that permits actual operating condition sampling without interrupting main lot dyeing.

— A high-pressure-dye-feed-kier which allows dye bath additions without pressure or temperature changes in the main body of the dye liquor.

— Quick heating and cooling with a Smith-Drum Heat Exchanger located *outside* the main dye liquor circuit, for easy access.

— Fabrication in accordance with code requirements.

And — the priceless, practical experience of Smith-Drum engineers.

Whether it's package dyeing, or paddle dyeing — rotary dyeing, or circulating dyeing — extracting or drying, if it has to do with textile processing, call on Smith-Drum.

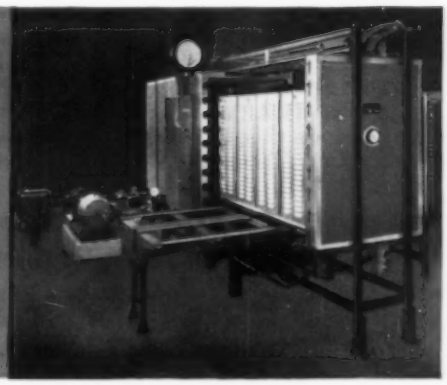
Smith-Drum Division
TURBO MACHINE COMPANY
Lansdale, Pa.

SOUTHERN SALES REPRESENTATIVES:
Parrott & Ballentine, Greenville, S. C.

Turbo

**Turbo FS-300 Steam Setter**

One of a famous line of heat setting and textile processing machines, the Turbo FS-300 is a combination, all-purpose steam setter. It is adaptable for yarns, fibers, sweaters, other garments and fabrics. Featuring Turbo Push-Button operation, it takes the guesswork out of setting — helps you get top-quality production everytime, all the time. Full information on request.





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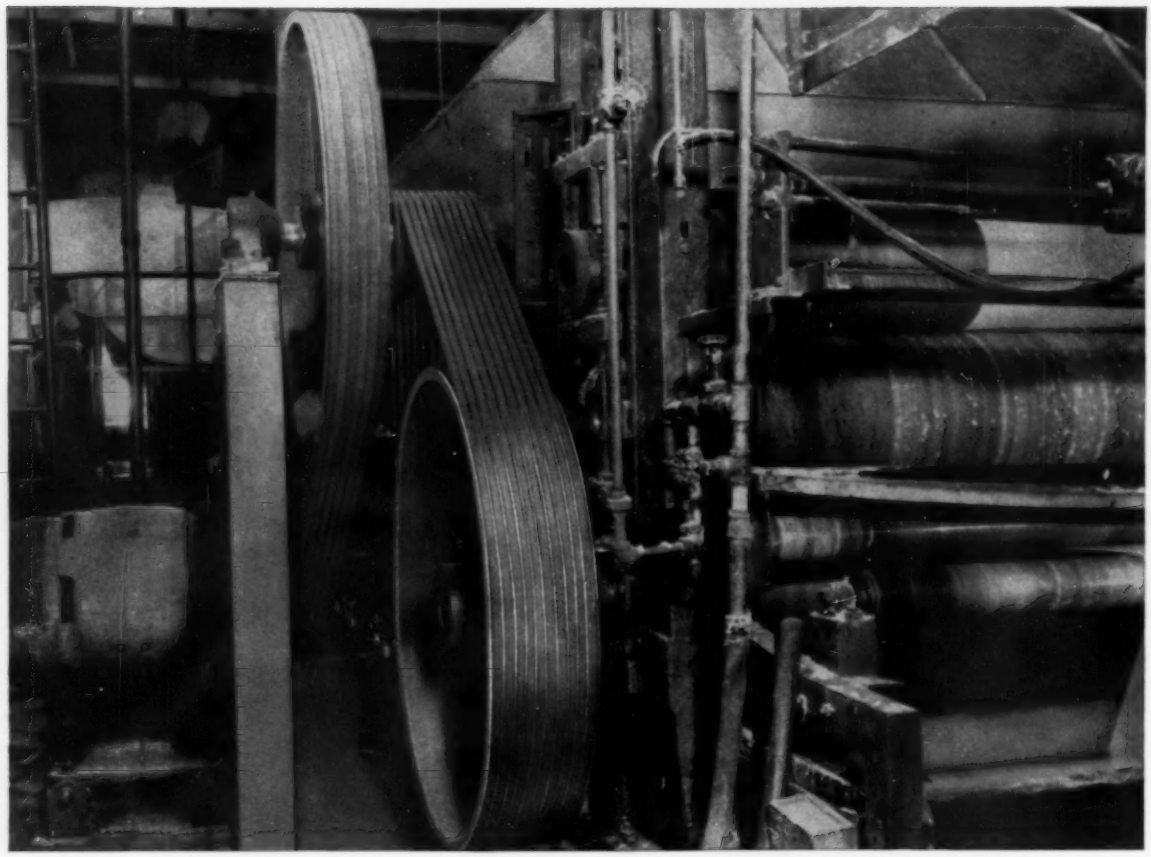

# MORE GRIP...LESS SLIP...LONGER LIFE

## Smoother Running Condor V-Belts give "More Use ~~per~~ *for your* Dollar"

R/M engineering micro-positions Condor V-belt strength members in special heat-dissipating rubber for a smoother, cooler running drive . . . and longer belt life under the heaviest drive loads. Flat-sidewall construction puts positive pressure on the sheave grooves to assure more grip, less slip. Flat-sidewalls help support super-strength synthetic cords in a straight line so that *all* cords pull *equally* . . . deliver their maximum, uniform share of the power! Pre-stretching during manufacture removes inelastic stretch that might otherwise occur on the job. The result? The smoothest running V-belts made . . . engineered for longer, trouble-free service, lower V-belt drive costs. Write for Bulletin 6868.

**R/M SUPER-POWER V-BELTS**—For longer life under shock loads, R/M Super-Power V-Belts deliver up to 40% more power. They're oil-proof, non-spark, and heat-resistant. Write for Bulletin 6628.

**R/M POLY-V® DRIVE**—A new belt drive concept for heavy duty power transmission. Eliminates V-belt matching problems. Delivers up to 50% *more* power in the *same* space as regular V-belts . . . or *equal* power in *less* space! Write for Bulletin 6638.

® Poly-V is a registered Raybestos-Manhattan trademark.

RM-662

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

**MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY**

# RAYBESTOS-MANHATTAN, INC.

Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls



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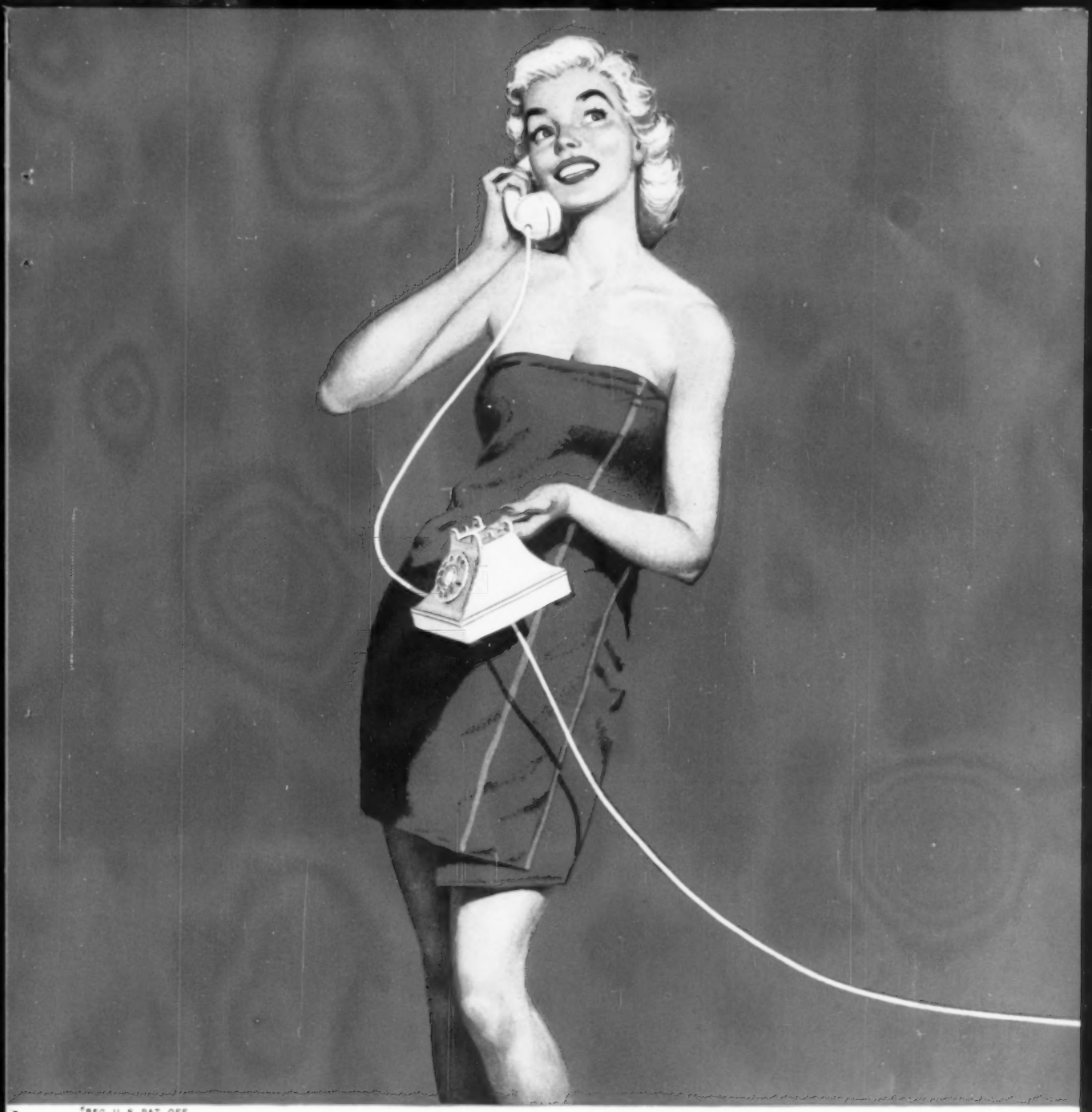


*REG. U. S. PAT. OFF.

# Busiest line in washable reds!

# AMANIL* NAPTHOLS

## and Fast Color Salts and Bases

Radiant, wash-fast reds that have become the standard of comparison in successful Napthol dyeing. Combinations assuring extensive shade variety throughout the red range and into gold. Perfect for red cotton rugs, toweling, shirtings, sportswear, corduroy. Outstanding for light fastness. For expert help with the Napthol process, write or call your A. A. P. representative at our nearest branch.

**AMERICAN ANILINE PRODUCTS**

A UNIT OF KOPPERS CO., INC

KOPPERS BUILDING, PITTSBURGH 19, PA. **PLANT:** LOCK HAVEN, PA.
**BRANCHES:** Providence, R. I. • Philadelphia, Pa. • Paterson, N. J. • Chicago, Ill. • Charlotte, N. C. • Chattanooga, Tenn. • Columbus, Ga. • Los Angeles, Cal.
**Dominion Anilines & Chemicals, Ltd.,** Toronto, Canada • Montreal, Canada

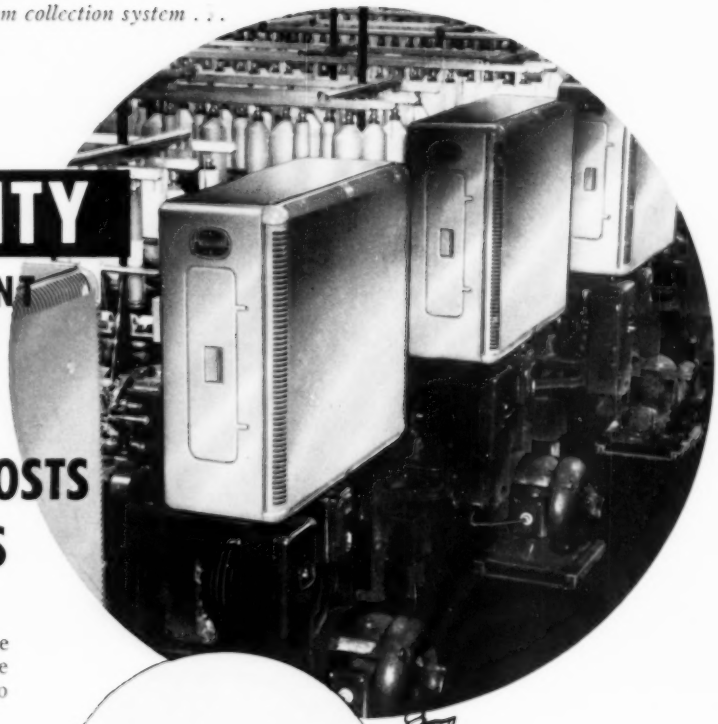
AIR QUANTITY
PRESSURE
HORSEPOWER
PNEUMAFIL

*When buying a vacuum collection system . . .*

# AIR QUANTITY

**is the most IMPORTANT factor in improving**

## YARN QUALITY
## PRODUCTION and COSTS
## ROOM CONDITIONS



**MORE AIR for BETTER QUALITY YARN**

The more free fibers picked up by the system at the drafting area, the less chance lint has of being spun into the yarn to cause slubs, gouts and unevenness.

**MORE AIR to INCREASE PRODUCTION . . . LOWER COSTS**

Front roll speeds and drafts can be increased providing the system can "swallow" more air to pick up the additional lint generated. More air for more effective cleaning reduces ends down, so spinners spend less time cleaning frames and piecing up ends. This means they can operate more sides and you get increased production at less cost.

**MORE AIR to IMPROVE all ROOM CONDITIONS**

Room conditions can be classified under three categories: HUMIDITY, TEMPERATURE, and CLEANLINESS. Frequent room "air changes" will help improve and control each of these conditions, and you get a more frequent air change from the collection system which pulls in more air per spindle.

The suction cleaning equipment made by Pneumafil Corporation is specially engineered to give you the highest economical air quantity and the most balanced conditions throughout the room. Get the complete PNEUMAFIL story today — you'll assure yourself a greater return from your investment.

**MORE AIR**
**Pneumafil equipment is specially engineered to "swallow" a maximum amount of air.**

**MEANS**

**MORE CLEANING**
**Pneumafil's exclusive "air flow" pattern filters out over 50% of the free fibers that would normally settle on machinery, floors and running work.**

*For more information please contact*

**PNEUMAFIL CORPORATION, CHARLOTTE 8, N. C.**

UNIT SYSTEM • CENTRAL AIR HANDLING • CENTRAL MATERIALS RECOVERY • LINT FREE CREEL • PNEUMASTOP • PNEUMAKOOL PNEUMACLEAR • PNEUMACARD

PNEUMAFIL®

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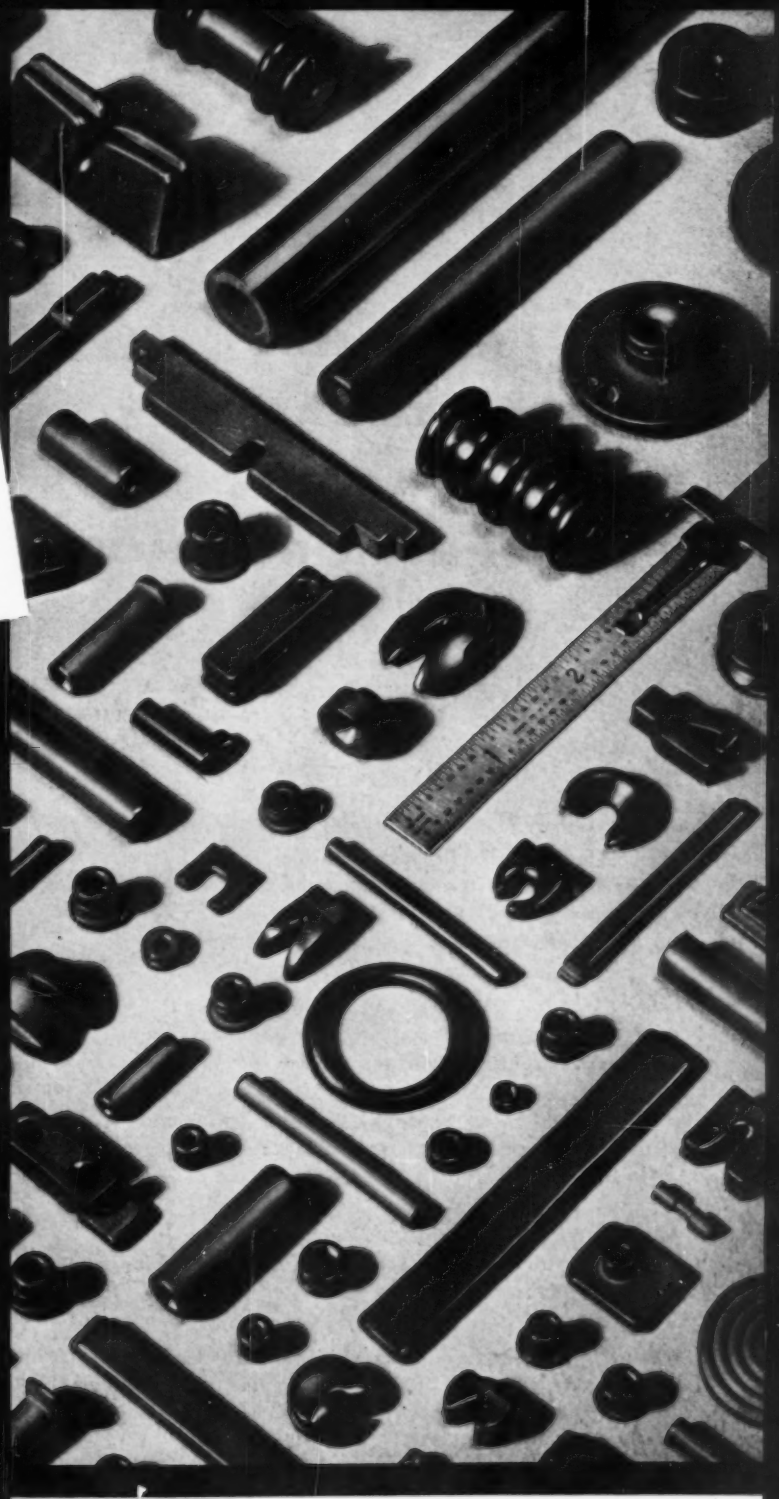
# ALSIMAG® 193

## ELECTRICALLY CONDUCTIVE THREAD GUIDES

(U. S. Patent No. 2,369,266)

**RECOMMENDED** by leading producers of synthetic yarns and by leading manufacturers of textile machinery to assist in the control of static electricity and to produce better quality yarn. Stock designs available for most equipment. Custom made at reasonable cost for special requirements.

***Test samples from our files on request.***



56TH YEAR OF CERAMIC LEADERSHIP

## *AMERICAN LAVA CORPORATION*

A Subsidiary of Minnesota Mining and Manufacturing Company

**CHATTANOOGA 5, TENNESSEE**

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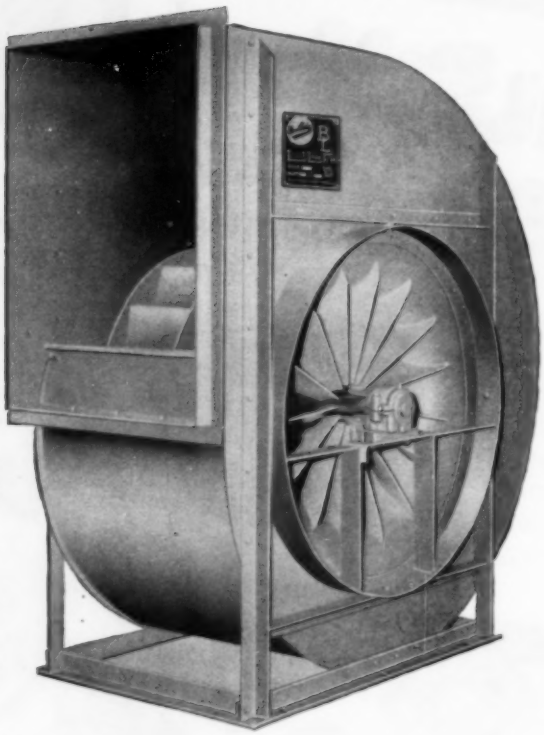
# MINIMUM MAINTENANCE PLUS PEAK PERFORMANCE



"Buffalo" Type "BL" Fan
For Industrial Air Moving

Trouble-free operation is yours with the "Buffalo" Type "BL" Fan because of its rugged, dependable construction.

- Blades are die-formed, welded and riveted for maximum strength.
- Heavy-gauge back plate and extra-heavy hub insure rigidity where it's needed.
- Self-aligning bearings (sleeve or anti-friction type) provide easiest maintenance and longest life.
- Deep-drawn inlet bell and stationary inlet vanes are of husky construction for long, trouble-free performance.

Highest efficiency is provided by the many unique engineering features of the "Buffalo" Type "BL" Fan.

- Backward-curved blades provide stable air flow and limit load horsepower characteristic.
- Shroud has full curvature to match inlet bell for smooth air flow.
- Correctly-proportioned housing is streamlined for peak efficiency.
- Full-rated delivery with minimum turbulence is assured by design of inlet guide vanes.

Whatever your air conditioning, ventilating or other industrial air moving problem, you can depend on the "Buffalo" Type "BL" Fan for a long life of high-efficiency performance with an absolute minimum of maintenance. For full information, contact your nearby "Buffalo" Engineering Representative — or write for Bulletin F-102.

With every "Buffalo" Fan you get the bonus "Q" Factor — the built-in QUALITY that assures trouble-free satisfaction and long life.

"Buffalo"

**BUFFALO FORGE COMPANY**
BUFFALO, NEW YORK
**BUFFALO PUMPS DIVISION, BUFFALO, N. Y.**
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • COOLING • HEATING • AIR TEMPERING • PRESSURE BLOWING • EXHAUSTING • FORCED DRAFT • INDUCED DRAFT • AIR CLEANING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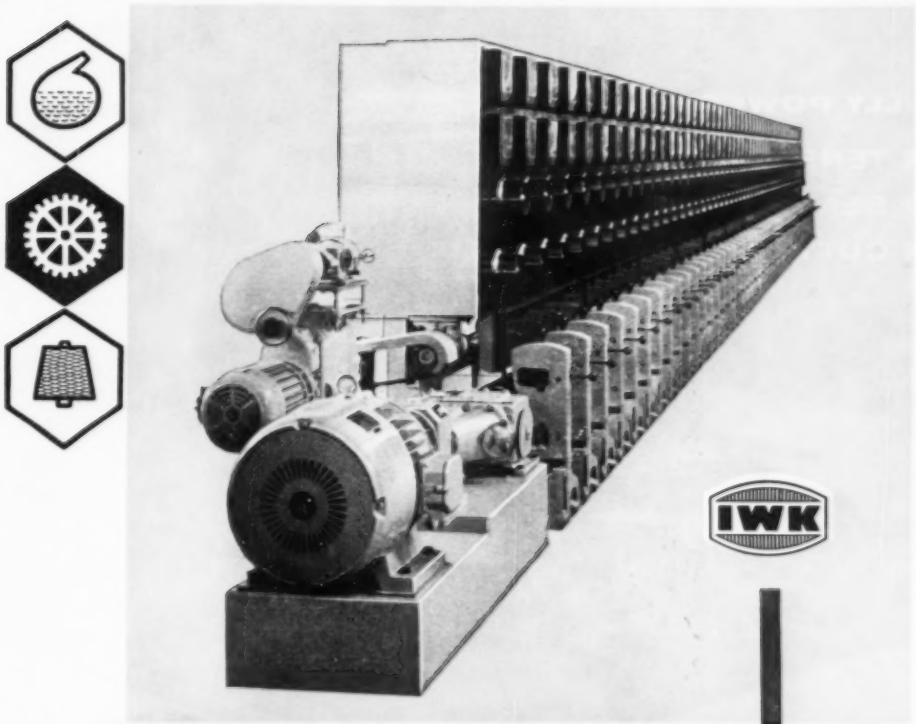

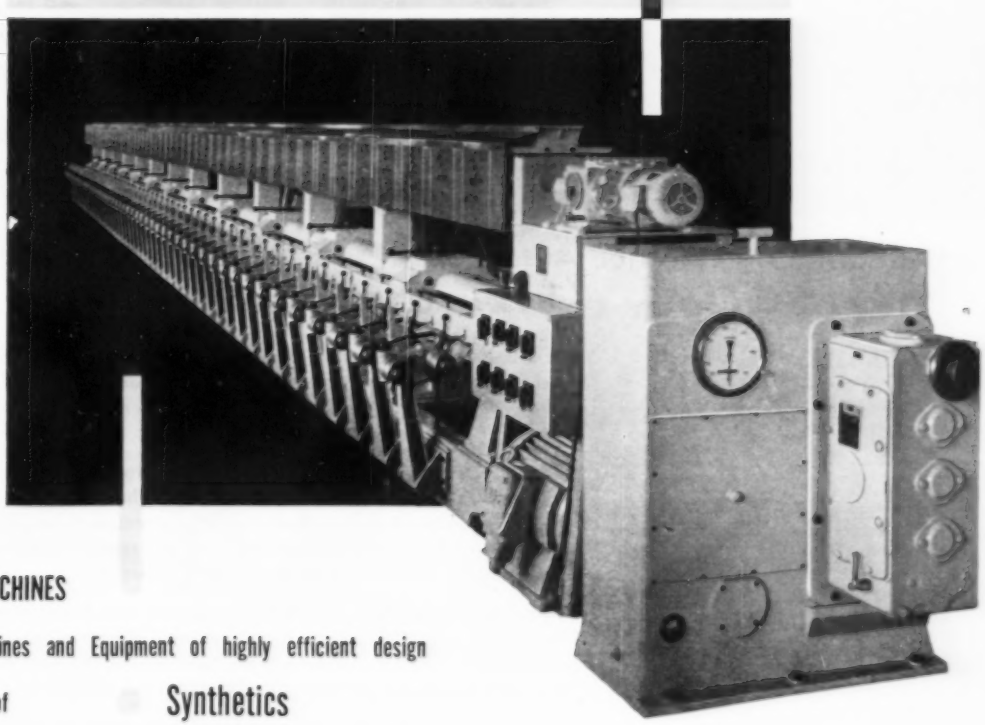

**TAKE-UP MACHINES**

**Special Machines and Equipment of highly efficient design**

**for spinning of**

- **Synthetics**
- **Acetate**
- **Rayon**

Your inquiries are invited

## INDUSTRIE-WERKE KARLSRUHE A. G. — KARLSRUHE/WESTERN GERMANY

*Exclusive Distributors* NATIONAL INDUSTRIAL MACHINERY CORPORATION—Suite 5119—Empire State Building
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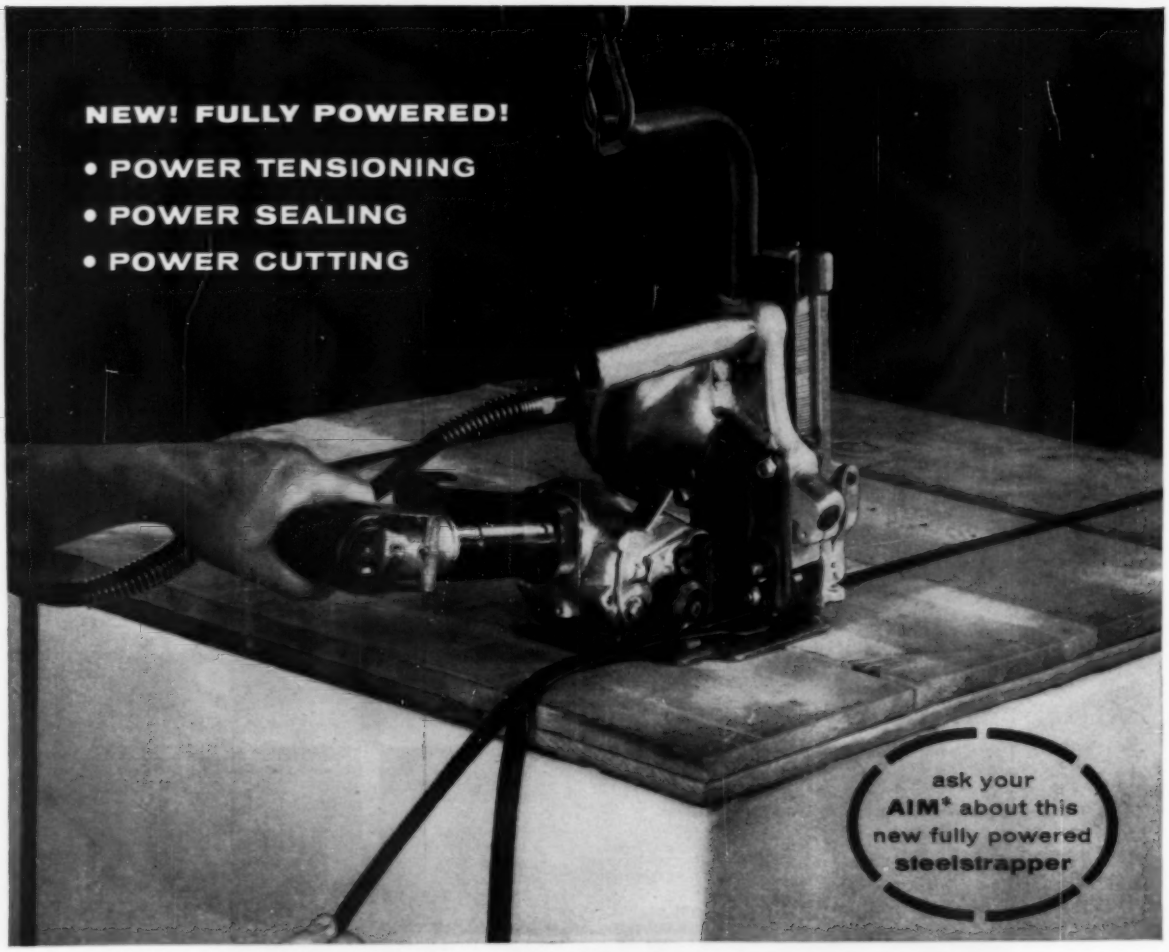
NEW! FULLY POWERED!
• POWER TENSIONING
• POWER SEALING
• POWER CUTTING
ask your AIM* about this new fully powered steelstrapper

Announcing another Acme Steel first...

## The new, fully powered A4 Steelstrapper

**ACME STEEL COMPANY** is first to offer industry a Steelstrapper that tensions, seals and cuts steel strapping automatically . . . all with air power. Called the A4 Pneumatic Steelstrapper, this new tool includes one-hand controls among its many features.

With steel strapping quickly and easily inserted, the operator merely presses a control on the handle to power-tighten strapping to predetermined tension. And then with another power control on the same handle, magazine-fed seals are applied and the steel strapping cut without waste or operator effort.

Your *Acme Idea Man can demonstrate the new A4 Pneumatic Steelstrapper and show you its many time, effort and money saving advantages. The first full-power tool of its kind, the new A4 Steelstrapper will give maximum performance in your steel strapping application.

Ask your Acme Idea Man, or write, for your free brochure detailing the features of the new fully powered A4 Steelstrapper.

**Contact your Acme Idea Man** at the nearest Acme Steel Company office. Or write: Dept. TAS-38, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

ACME STEEL **STEEL STRAPPING**



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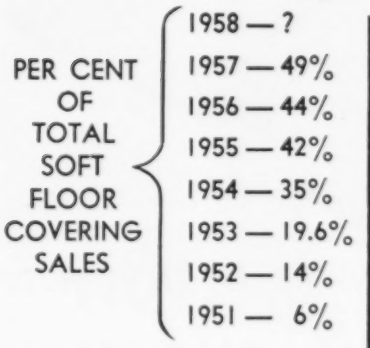
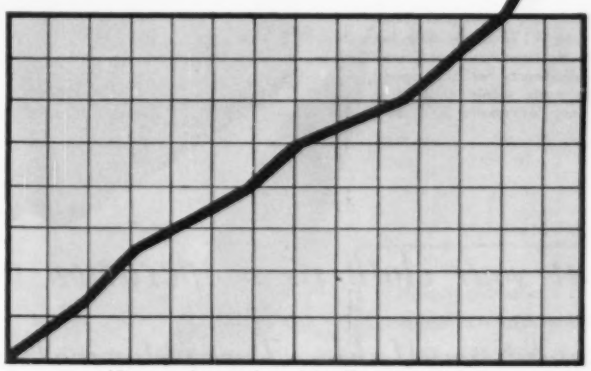
# The Sky's the Limit!

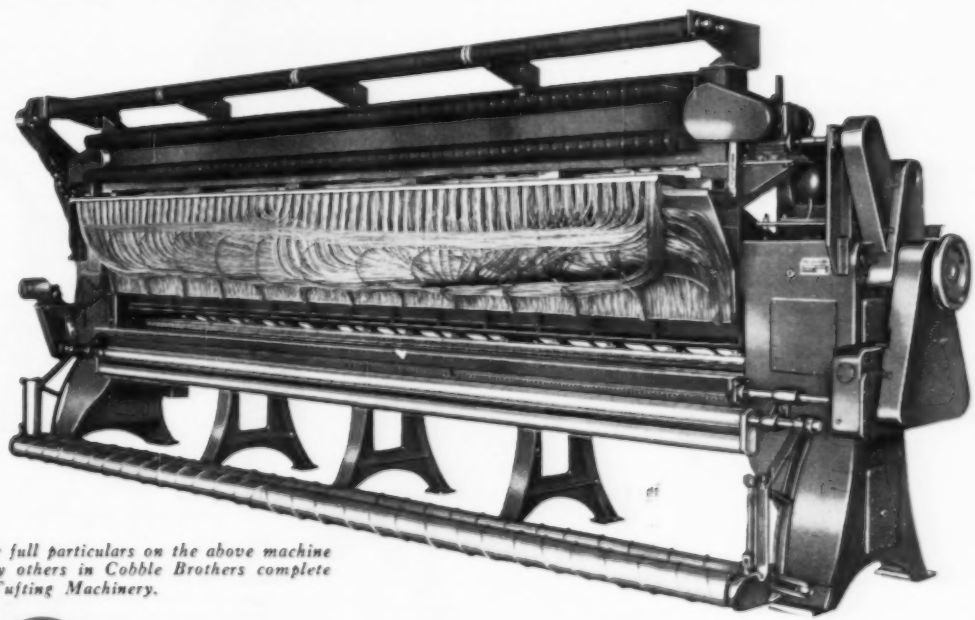


(Figures above released by Carpet Institute.)

Tufted production in the carpet industry has shown a constant increase since the beginning in 1951. Starting at zero and jumping to 49% of total carpet sales in six years is quite a record. And . . . one can look for another increase in 1958 with the sky the limit for the future.

Cobble Brothers, as the largest and oldest manufacturer of Yardage Tufting Machines, has provided much of the machinery that has helped make the 49% figure possible. An example of Cobble Brothers' ingenuity and craftsmanship is the new 216-inch Single-Needle Control Scroll Type Pattern Machine shown below.



*Write for full particulars on the above machine and many others in Cobble Brothers complete line of Tufting Machinery.*

**COBBLE BROS. MACHINERY CO.**

RIVERSIDE DRIVE • PHONE OX 8-3481 • CHATTANOOGA, TENN., U.S.A.
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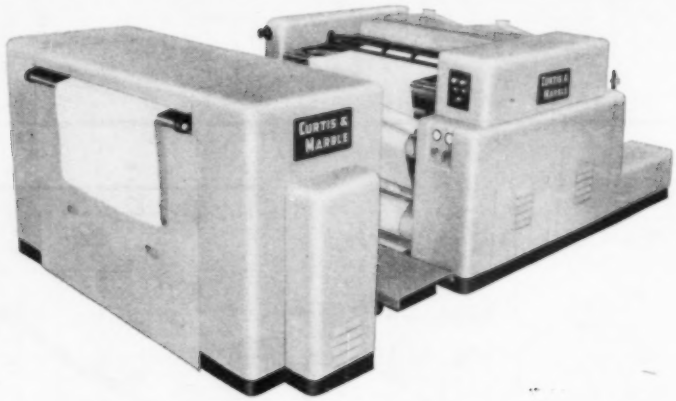


*Look at your cloth room operation in the light of new machinery now available. Technological progress has already taken the profit life out of many machines now in use. Get the facts about new Curtis & Marble machines from one of our engineers. Keep ahead of competition! Find out why more textile men choose "C & M".*

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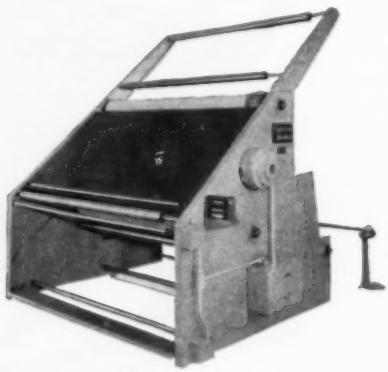
High speed Singer Head with automatic splash oiling system and chain stitch. New positive drive. Merrow Head optional. All widths.



**B-H CLOTH INSPECTOR**

Newest design for inspecting and measuring large batched rolls and re-rolling into same size roll. Cloth travels towards operator. Sky roll arms for long view. Safety steel side panels. Reverse with scray.

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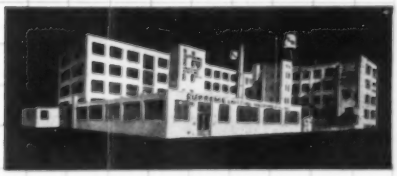
Look to Supreme for the latest in novelty yarns of all types including nub yarns for fine gauge as well as coarse gauge machines, chenilles, bouclés, splash, etc., made of natural, synthetic or blended fibres. Supplied natural or dyed to your specifications.

OUR TECHNICAL CONSULTATION SERVICE makes available to you a unique fund of knitting knowledge and experience to help plan your novelty fabrics. Our personnel can recommend the proper novelty yarns for your sales field. These yarns can be tailored specifically to knit efficiently on your equipment.





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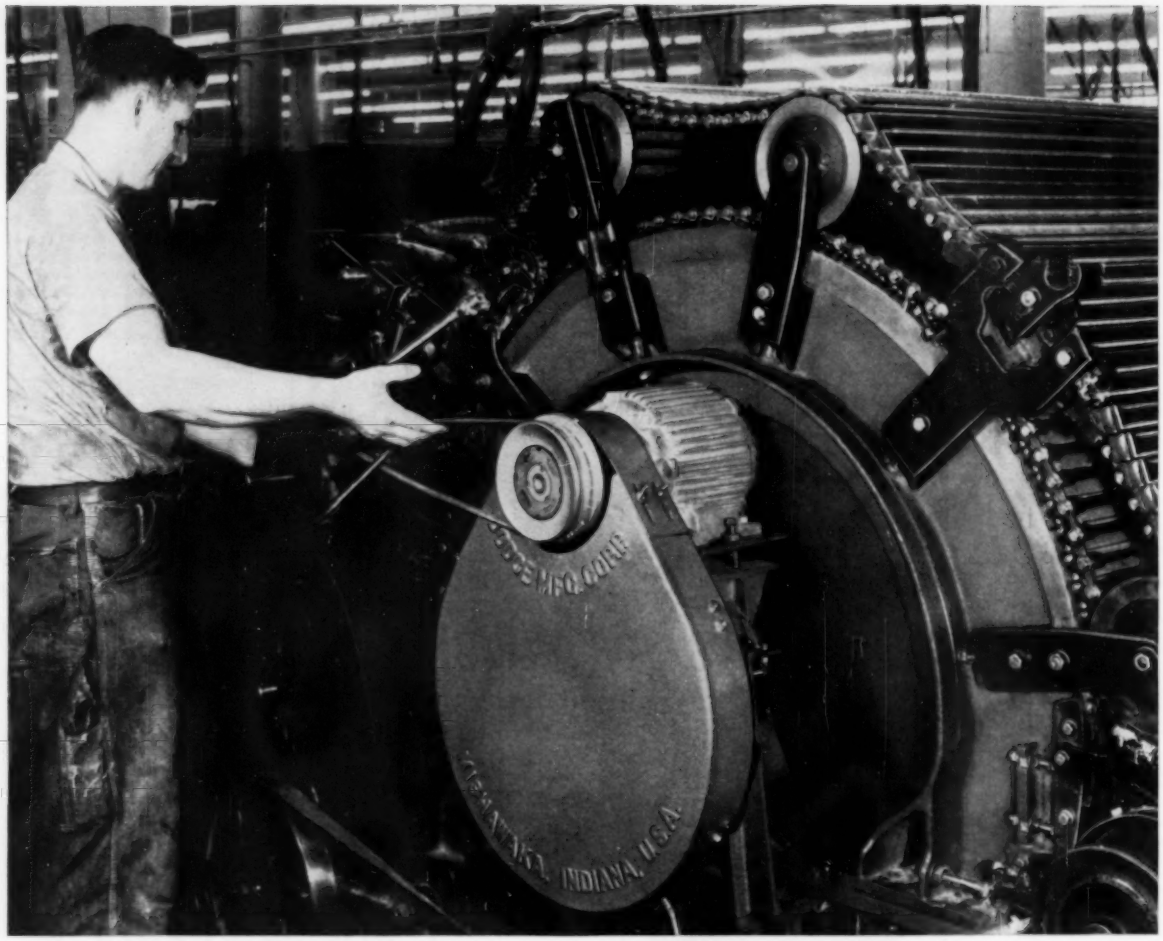


# INDIVIDUAL CARD DRIVE GIVES SOFT STARTS

## ...ACCELERATES QUICKLY TO FULL SPEED

## ...AVOIDS EXCESSIVE STRAIN

Flexidyne, heart of this new complete Card Drive by Dodge, picks up the load smoothly... protects machinery and motor against shock and overload . . . delivers 100% efficiency during running cycle. Flexidyne, *the Dry Fluid Drive,* eliminates need for high torque motors and expensive controls, saves power, provides a new and better way to drive textile machines.

Note the special aluminum pulley mounted on Flexidyne housing, enabling quick, convenient operation of stripper. Pedestal has adjustable motor base to control tension on V-belts. You should have the full story of all the advantages of the new Dodge Flexidyne Card Drive. Ask your local Dodge Distributor, or write us, for new illustrated Bulletin A-653.

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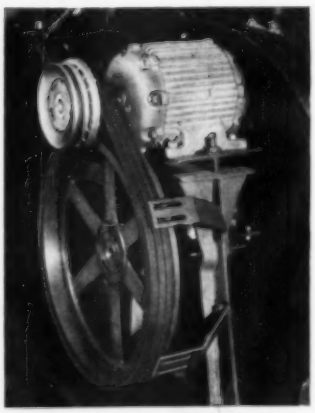
**1400 Union Street, Mishawaka, Indiana**



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- V-flat drive
- Aluminum stripper pulley
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**CALL THE TRANSMISSIONEER** — your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look in the *white* pages of your telephone directory for "Dodge Transmissioneer."



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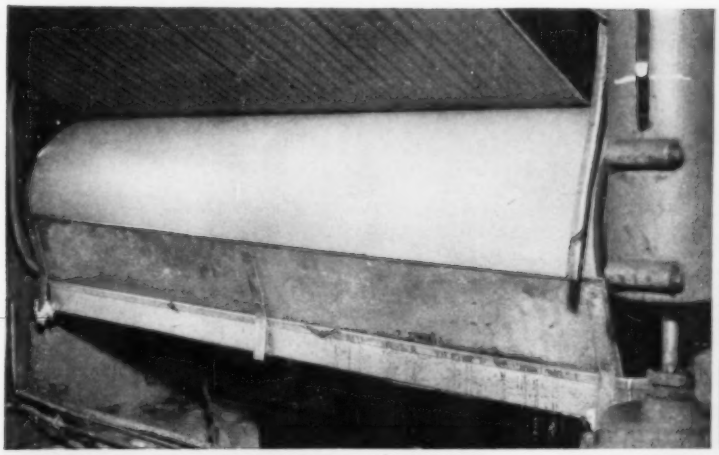

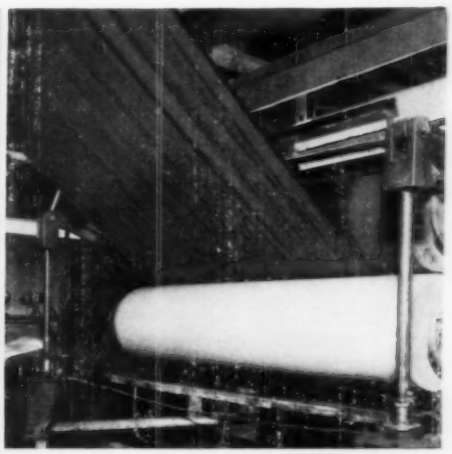

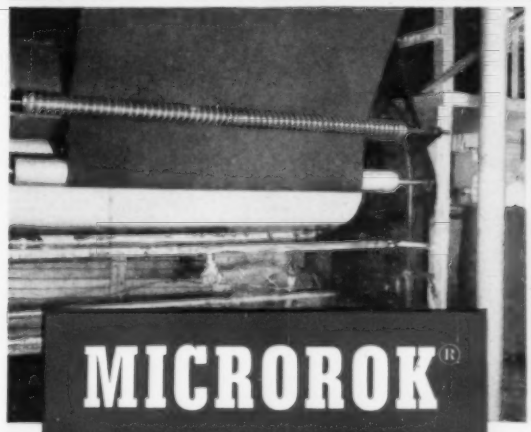

# MICROROK®

## ...cuts bottom roll maintenance

Frequently, the cost of removing bottom squeeze rolls exceeds the cost of their grinding or recovering. Loss of production and, in some cases, the expense of hiring riggers to handle these heavy, hard-to-get-at rolls, are profit-stealing problems.

Microrok is compounded and built to last longer. The first Microrok roll installed in a textile mill has been in continuous operation for over four years. Removed from its carbonizer unit for inspection only once two years ago, it showed less than .001" loss of crown. It was reinstalled and has been running continuously since.

Other Microrok rolls are being used as padder, mangle, squeeze and washer rolls, with equally successful results.

Ask your Stowe-Woodward Sales Engineer about Microrok, or write today for your copy of "MICROROK — the miracle roll covering," Bulletin 504.

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S-W INC.

**STOWE-WOODWARD, Inc.**

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**NEENAH, WISCONSIN • NEWTON 64, MASS. • GRIFFIN, GEORGIA**



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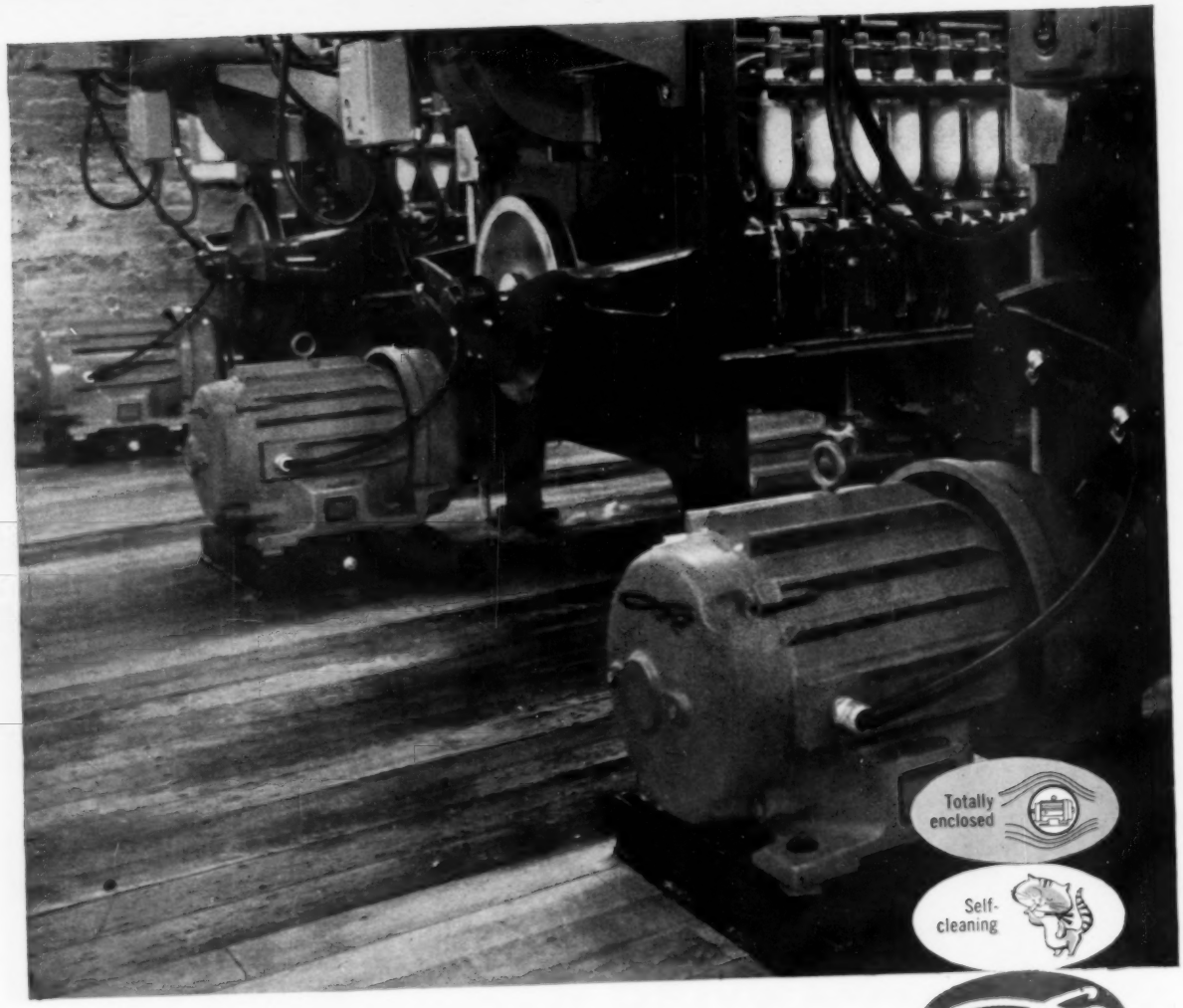


# "Seconds" reduced with self-cleaning motor

## New Louis Allis textile motor runs cooler, reduces lint pile-up, won't dry out ends

The new Louis Allis "Clean-Flo" textile motor is specifically designed to meet your mill requirements. "Clean-Flo" is totally enclosed — lint absolutely can't contact the inside of the motor.

"Clean-Flo" is cooler running than other motors, too. It's designed to mount a fan several sizes larger than normal to blow considerably more air across the motor. That means fewer cooling ribs are needed, so there are none on the bottom of the motor, and a further chance of lint pile-up is eliminated.

The big fan on the shaft extension end holds down any heat build-up, and limits the transfer of heat to the spinning frame. The motors pictured above are mounted to blow lint away from the driven machine so that spindles will not dry out.

The "Clean-Flo" is also available with "soft-start" characteristics needed in roving so that ends won't break. It's a built in feature — no extra control mechanism is needed to get the easy start.

Write for Bulletin 1850, "Clean-Flo Textile Motors" to your Louis Allis District Office, or The Louis Allis Co., 443 E. Stewart St., Milwaukee 1, Wisconsin.

**LOUIS ALLIS**

MANUFACTURER OF ELECTRIC MOTORS AND ADJUSTABLE SPEED DRIVES



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# NEW TAX CLIMATE

## for your new plant

The fact that Pennsylvania manufacturers will save an estimated $45 million in taxes during the current biennium proves our point. To create this "tax climate" favorable to new and expanding industry, the state legislature has taken these steps:

1. Exempted manufacturers from capital stock and franchise tax.
2. Eliminated local *ad valorum* property taxes on machinery and equipment (there is no state-level general property tax).
3. Repealed tax on stock transfers.
4. Made 3% sales tax permanent—now the principal source of state revenues.
5. Reduced the sales tax on purchases by manufacturers.

Add the fact that Pennsylvania has no state personal income tax, and you can see how all this creates a favorable tax climate. Use the coupon below for details.

W E S T  P E N N  P O W E R

an operating unit of the WEST PENN ELECTRIC SYSTEM

### Hello...

I'm Charlie Fife. I want to stress the point that this good tax news is only one of many facets that interest manufacturers in expansion in WESTern PENNsylvania.

For example, we have communities offering **100% financing** in attractive lease/purchase agreements; interest as low as 2%, with deferred amortization, can be applied on up to 50% of total plant cost.

**Skill surveys** and labor inventories in our files show the true picture of **labor availability,** both male and female.

We'll gladly assign a **plant location specialist** to personally assist in your evaluation of WESTern PENNsylvania. There is no charge for this professional service. And, you can be sure that West Penn Power will respect your confidence.

CHARLES M. FIFE, *Manager*
*Area Development Department*

WESTern PENNsylvania

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Yes, I'm interested in WESTern PENNsylvania:

☐ Please send details on taxes. ☐ Please send booklet, "Plant Location Services."

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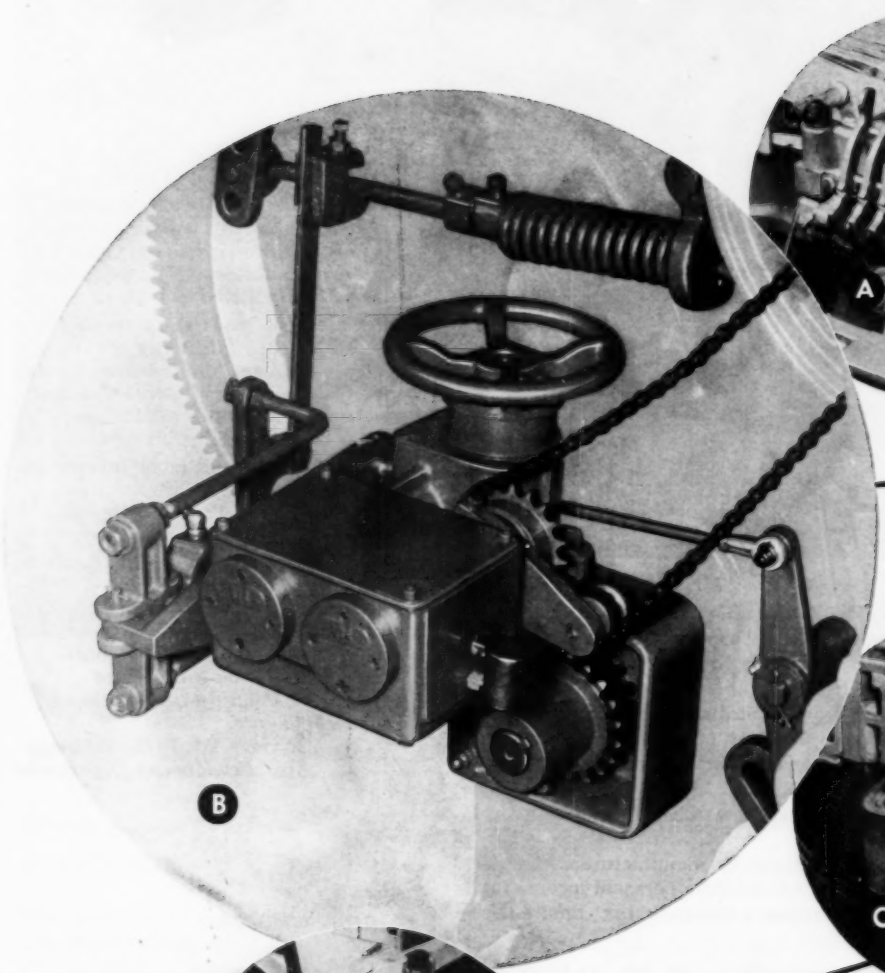
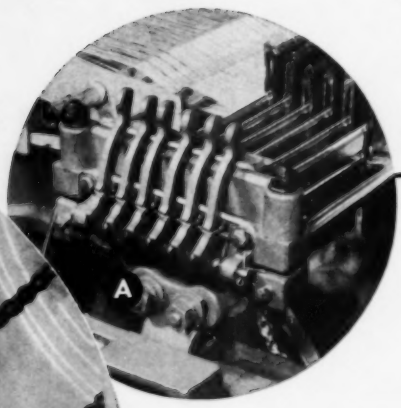
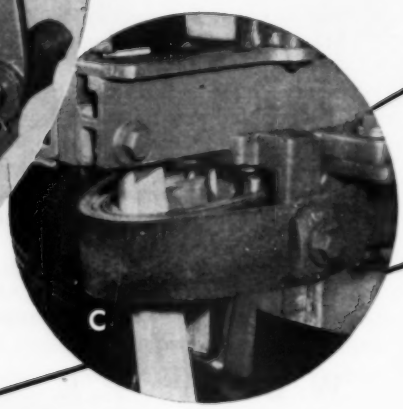
Company_____ Street_____

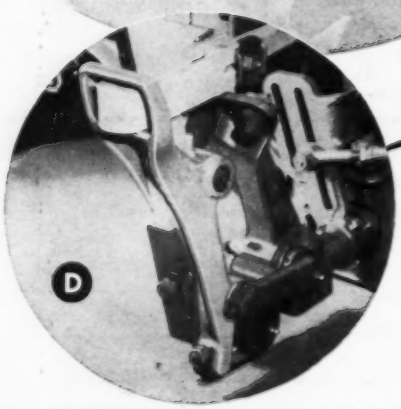
City_____ Zone_____ State_____

# *Proven*
# Loom Developments . . .



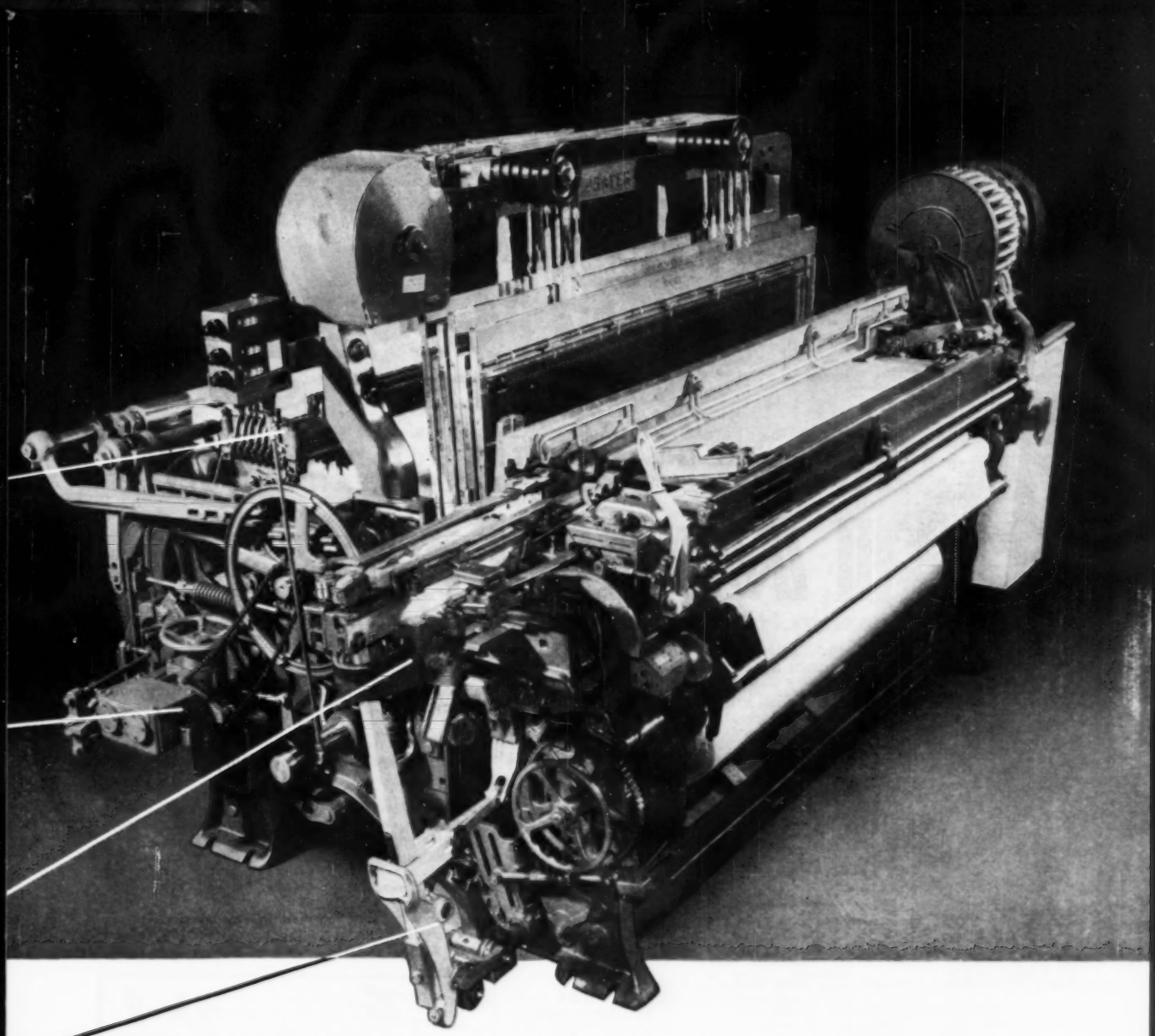
Member of
American Textile Machinery Association

**A** K-A Electric Warp Stop with Serrated Blade provides a quick, positive means for locating a "down" drop wire.

**B** Draper Tru-Tension Let-off automatically controls yarn tension from full to empty beam with little or no adjustment needed, once the initial settings are established.

**C** Draper #14 Shuttle Check improves shuttle boxing. Simplified settings effect labor savings.

**D** Draper Link Type Parallel gives a uniform, controlled picking action . . . improves loom operation . . . reduces wear on pick motion and parallel parts.



# . . . increase the versatility and efficiency of the Draper X-2 Model Loom

The Draper X-2 model loom, incorporating many new *tried and proven* loom mechanisms, contributes to greater weave room economy.

The new Tru-Tension Let-off controls yarn tension automatically, from full to empty beam. Cloth defects commonly attributed to the Let-off are eliminated and substantial savings are possible on critical weaves.

Other loom developments, including the Link Type Parallel, #14 Shuttle Check and the K-A Electric Warp Stop with Serrated Blade improve loom performance . . . reduce down time and costly repairs.

These and many other Draper loom attachments combine to increase the versatility and efficiency of the Draper X-2 model loom.

**DRAPER CORPORATION**

**HOPEDALE, MASS.**

Atlanta, Ga. • Greensboro, N.C. • Spartanburg, S.C.

No matter the CLEANING JOB You Can . . .

IS PRACTICAL FOR USE IN THESE OPERATIONS

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# STOP FIRES BEFORE THEY START

(Reg. U.S. Pat. Off.) WITH THIS ABSOLUTELY SAFE, NON-INFLAMMABLE, INEXPENSIVE, VERSATILE CLEANING SOLVENT

# IMMUNOL

Proven by 11 Years of Continuous Use in Leading Mills—Everywhere

**SAFE TO STORE** . . . . IMMUNOL is completely safe in any form for any period of time. Also, less storage space is required.

**NON-FLAMMABLE** . . . . . Absolutely no danger of fire whatsoever when IMMUNOL is used. Replace those dangerous and combustible solvents and cleaners now!

**SAFE TO SKIN** . . . . . Never any skin irritation when cleaning is done with IMMUNOL. Workers can even wash in IMMUNOL without any ill effect.

IMMUNOL removes dirt, soil, grease size and mill film quickly and easily. It is a superior general cleaner or mill equipment and machines. IMMUNOL is positively safe in **every** way.

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**INEXPENSIVE** . . . in addition to its low cost, other money savings accrue from using Immunol; benefit from reduced damages, insurance rates, labor costs and elimination of protective garments and devices.

**INHIBITS RUST** . . . Immunol leaves an invisible protective rustproof coating without oily residues. No need to wipe it dry.

**MORE EFFECTIVE** . . . Immunol may be applied in any manner. It may be wiped dry or allowed to dry. Eliminates lap ups caused by solvent residues.

**IMMUNOL** will completely wash out of any fabric and will not affect the shade of any fabric not affected by plain water. Send for free literature explaining the versatility and safety features if IMMUNOL.

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ORIGINAL COLLOIDAL LUBRICANT

Effects substantial savings when used as a stock lubricant, a warp sizer, softener and binder, and as a cone winding lubricant. Binds fibres without being sticky. Eliminates neps and pilling. Adheres uniformly to all fibres. Reduces fly. Increases the tensile strength of fibres. Reduces breakage of treated yarns. Scours out completely. Eliminates migration. Safe to fabrics unaffected by plain water or an alkalinity of 8.0.

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# The New Textile Industry

We have talked a great deal on this page in late months about the new textile industry now in the making. We're sure that a great many mill men, perhaps even a majority, have been unimpressed. Most textile men are so deeply involved with daily tasks that they have little time or interest in anything else; and it's easy, and comfortable, to assume that things will continue pretty much as they are.

The truth is that the textile industry has been in an almost constant state of upheaval since the 1920's.

A mill man has to be no more than middle-aged to remember the shock of timestudy (the "minute men"), the surge of cotton-mill migration to the South, the tremendous changes brought by long-draft roving and spinning and one-process pickers, and the widespread effects of wages and hours control. And even the youngest men have seen the impact of new fibers, income taxes, the American system of worsted spinning, tufting, nonwoven fabrics, and chemical treatments of fibers and fabrics.

## The Coming Change

There is little doubt that the industry is now poised for another surge of change.

Profits are low, and there is no promise of any vast new or emergency demand for textiles. With the supply of textiles and competition holding prices down so that profits have little likelihood of rising very significantly, there are only two ways to improve profits: reduce costs and develop new products.

These are the conditions that have always triggered major change. No mill makes improvements because it wants to. On the contrary, most of them hold out against change as long as possible—often to the point of liquidation.

However, the sole purpose for being in business, for operating a mill, is to make a profit. When a profit cannot be made or when it's so small that it no longer represents satisfactory operation under a given set of conditions, there is only one thing to do: change the conditions.

In the final analysis, all change, all improvement, flows out of that basic proposition. And it is that set of conditions now that must lead to drastic changes in the textile industry.

## The New Industry

In a very real sense, the industry must become a new industry. Actually, forces are already at work that are likely to make present mill operations hardly recognizable a generation from now.

Automation [TEXTILE WORLD, Jan., '58, p. 67] is beginning to take hold in textiles. Most mill men have been inclined to look down their noses at automation and point out that the textile industry invented it and there's nothing new about it.

It's true that "automation" is an unfortunate word; it's about as silly a word as the "Ingredient X" of television commercials. But the proposition of automation—doing work mechanically, electrically, and electronically rather than manually—can be the difference between profit and loss. Therefore there is no chance at all of mills escaping it.

Research is another word that mill men don't like. But research also can be the difference between profit and loss, and therefore the textile industry can't escape it. More and more, mills will be concerned with such things as radioisotopes, dielectric heating, chemicals they haven't heard of yet, controls and test methods not yet invented.

But back of it all, the one absolute necessity for profit is men—men who are not afraid of the new, not afraid of change and improvement—men who have the courage and drive to step out ahead of the throng—men who have the vision to see tremendous possibilities in the old but ever-new textile industry but who never lose sight of the big, basic fact that the whole purpose of it all is profit.

*J. M. Thomas*

## When there's fun in the air

Fun-time is knitwear-time — time for the kind of quality knitwear that can stand up and take it, and still retain its style and comfort. That's the kind of knitwear that's made on machines equipped with Arrow Latch Needles, Flat Stock and Leaded Assemblies. Backed by Textile Machine Works' half-century of service to the industry, Arrow Latch Needles assure you of free latch movement, a strong latch, and a smooth finish. Available promptly from stocks in Reading, Pa., Asheboro, N. C., and Manchester, N. H.

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# How Research Shapes Our Future Prosperity

**If you are looking for an industry that is going to keep on booming in 1958 and every year for the next decade, here it is. It is the industry of technological innovation through research and development.**

Last year this great new industry spent over $7 billion to discover and develop new industrial products, processes and equipment. This year the preliminary McGraw-Hill survey indicates that total expenditures for industrial research and development will be even greater, perhaps as much as $8 billion. Of the companies surveyed, 57% plan to spend as much as in 1957 and 38% plan to spend more.

**The sustained expansion in research and development is the best guarantee we have that the current decline in business investment in new plants and equipment will be relatively short-lived.** There can be no prolonged decline in investment in an economy where technology is changing rapidly.

This editorial is designed to show how the continued surge in research and development can be expected to lead first to new products, and eventually to renewed expansion of investment in new industrial plants and equipment. Such expansion is the essence of national economic growth.

## A Slow Start

The impact of research on sales and investment is still very gradual. Research spending itself has more than doubled in the last four years. But only 32% of all manufacturing firms report significant capital outlays to make new products. We are not reaping the full dividends of industrial research as yet for several reasons:

- Research expenditures were relatively small until the Korean War of 1950 brought substantial government contracts in aviation, electronic and related fields. Heavy research outlays for civilian and industrial products came even later.

- There is an average *lag*, according to research directors consulted by the McGraw-Hill Department of Economics, of roughly seven years from the start of research until the product is ready for large scale output — about five years of research and at least two years to solve production problems and develop markets.

- Complex products, such as new consumer durables and industrial machinery, have an even longer time lag.

However, new developments are certainly underway. Research began to increase in all lines of business when Korean War restrictions and

the excess profits tax came to an end in 1953. The tax revision of 1954 added a new incentive by making research outlays deductible as a current business expense. By 1955, the research boom was on.

## When Is The Payoff?

With a lag of about seven years, it will be the early 1960s before these new developments become a dominant factor in capital investment. But once the flow of new products and new processes starts, it will accelerate sharply — just as research spending has accelerated in the past few years.

By 1960, over $50 billion in sales will be coming from products not on the market as recently as 1956. Sales of new products will increase year by year, but they will gain most in 1960-1962, or five years after the recent spurt in research expenditures.

Capital expenditures to manufacture new products will also rise, but with a slightly longer lag. Here the sharpest rise should come in 1962-1965, as the new products reach a volume that calls for a significant amount of new capacity. In most cases, initial output of new products will come from existing capacity.

This timing of a new wave in capital investment appears logical on other grounds. Population experts forecast an upsurge in marriages and births around 1965. So by 1962, industry will be starting to tool up for new mass markets.

**The important point is this: As we approach the 1960s more and more sales and investment will be in new products growing out of research.** By 1960 well over 10% of manufacturing sales will be in new products not on the market in 1956.

Meanwhile — research will help stabilize capital spending by raising the level of modernization and replacement expenditures. Of course, research does not eliminate all the ups and downs in the demand for capital goods, for there remain variations in the amount spent to expand capacity. But a high level of modernization, to cut costs and improve quality, does put a floor under any drop in investment.

## What To Expect

During the next few years we can expect an increasing flow of new materials, new metallic alloys, new machinery — primarily those developments coming out of long-established research programs in the chemical and electrical industries. Industry will make wider use of specialized computers and automated equipment.

But the dramatic payoff on research comes even later. In the early 1960s the consumer goods industries will begin tooling up for their really new products — things so basically new they can change the way a family lives. Such items as plastic houses, paper apparel, turbine autos are under development right now. But it will take several years to get costs down and for population and incomes to grow to the point where mass markets are created.

When we reach that point in the mid-1960s, there will begin the greatest surge of capital investment in all history. And then — around 1965 — the new processes (full automation, atomic power, continuous steel casting) which are the slowest and most expensive part of the research chain to develop, will come into play.

**The combined impact of new products and new processes, to meet an expanding market, will thus be felt in the mid-1960s — eight to ten years after the recent sharp increase in research spending.** The full impact is that far away because of the lags for applied research, pilot plant studies and market introduction. But to a large degree the prosperity of the 1960s has already been shaped by the research programs now underway.

*This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nation-wide developments. Permission is freely extended to newspapers, groups or individuals to quote or reprint all or parts of the text.*

Donald C. McGraw
PRESIDENT

**McGRAW-HILL PUBLISHING COMPANY, INC.**

Textile World

Volume 108, No. 3. March, 1958

# Employee Likes and Dislikes Revealed by ATTITUDE SURVEY

**• Do you want to know what your employees think of you and your company? This mill did, and it got some gratifying—and also some embarrassing—answers to its questions.**

A MILL with an excellent personnel-relations program wanted to learn the attitudes of its employees. So it engaged an outside group to make a survey.

The results of the survey are interesting and revealing. They form a blueprint to show management some needed changes and improvements, as well as letting it know just what the employees as a whole think of the present setup.

On attitudes toward the company, 83% said the mill was a good place to work and 66% said employees were proud of working for the company.

That the company is fair in its dealings with employees was agreed by only 53%, but 66% said that if they had it to do over again they would choose this mill as a place to work.

On attitudes toward higher management, 61% believe that the company is well managed. Management officials are friendly, said 81% of the employees; but only 55% of them believe that management is really interested in employee welfare.

### Supervisors Are Easy To Work For

The immediate supervisors didn't fare too well in the survey. Although 71% said their supervisor was easy to work for and 48% said that he treated employees fairly, only 38% were satisfied with the way he handled grievances and complaints.

On working conditions, 63% said they are good; and half the employees agree that they are allowed to do their work without undue pressure from above. Only 37% believe that the amount of work they are asked to do is reasonable, but 61% think that the company provides them with the equipment necessary to do a good job.

On the question of pay, 64% said the rates compared favorably with that of other companies for similar work; and when compared with other employees of this company, 54% said they are being paid fairly. But only 18% agreed that a hard-working employee gets a raise as often as he deserves.

That pay is in correct proportion to work involved was agreed by 25% of the employees, and 31% said they can get along without undue strain on their present pay.

### Company Provides Steady Work

On job security, 80% believe the company has a healthy and secure business future, 49% know where they stand with the company, and 33% feel free to voice complaints. That the company is considerate of its old-timers is agreed by 86%, and 96% believe the company provides steady work.

Only 37% think that a person with ability has a good chance of getting ahead, but 32% agree that the company is fair and impartial in its promotion policy.

The company looks for people inside the organization for promotion before hiring outsiders, say 48% of the employees. That work experience is given full consideration in selecting employees for advancement is agreed by 31%, and 54% think the company gives them a chance to see what they can do.

About information, 45% say they are adequately informed of developments within the department but only 33% believe they are told enough about what is done in other departments. That the way wages are figured is adequately explained is agreed by 43%, employee benefits have been explained to the satisfaction of 65%, and 55% say that they are told about changes far enough ahead of time.

### Most Employees Like Present Jobs

Of all the employees, 75% say they like their present job and 57% agree that the job gives them a chance to do the kind of work at which they are best. That most of the things they have to do on the job seem necessary is agreed by 74%, the job is interesting to 62%, and 83% believe their job is considered important by the company.

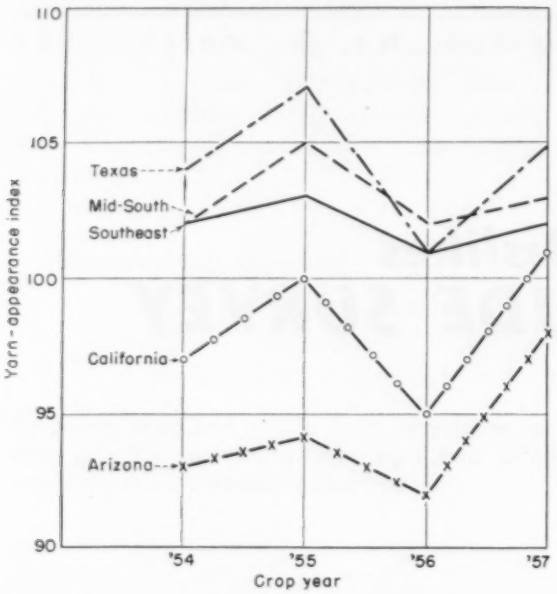
On relations between employees, 85% think most employees get along well with each other, 54% say that employees help each other, and 47% agree that they get cooperation from the employees of other departments.

Most employees in the work group are carrying their fair share of the load, say 64%; and 90% count personal friends among their co-workers.

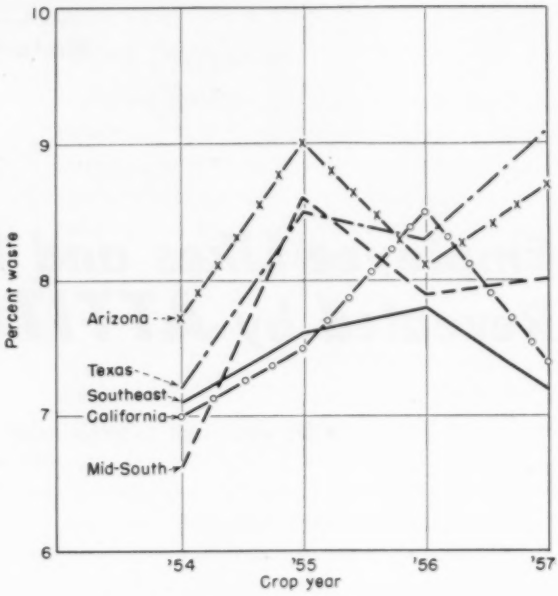
During the survey, the employees were asked to jot down what they liked about the company and what they didn't like. They were also asked to air peeves and to make suggestions.

CONTINUED ON PAGE 179

YARN-APPEARANCE INDEXES




PICKER AND CARD WASTE




# What You Can Expect From 1957 COTTON

**USDA fiber and spinning tests, based on early pickings, show that—**

- **Fiber and spinning qualities are off in rain-damage areas**
- **Grades are off in the Central area and Texas, but staple length and fineness are satisfactory**
- **Fiber and yarn properties are normal in the Southeastern states**
- **The best cotton this year was produced in the Far West area**

**BY F. L. GERDES,** Cotton Technologist, USDA, Retired

Early-season-cotton spinning tests indicated that good-spinning cotton, especially in the medium and higher grades, will be in very short supply this year.

Fairly good yarn can be made from the lower grades from the Central-area states, however, because of exceptionally good Micronaire fineness that now is an inherent characteristic of cotton from this area. Fineness of the 1957 crop developed before the unseasonal fall rains began.

Fiber tensile strength for the different regions had a range of 77,000 psi. in the Central states to 88,000 psi. in Arizona and California. Compared with 1956, the Central area is the only region showing a significant reduction in strength during the current season.

### Micronaire Values Improve

Micronaire values improved noticeably in 1957 over 1956 in the Central states and Texas. The range in 1957 was from a low of 4.1 in the Southeast to a high of 4.6 in the Central states, Arizona, and California. Good Micronaire values were found in the last three areas during the last three seasons.

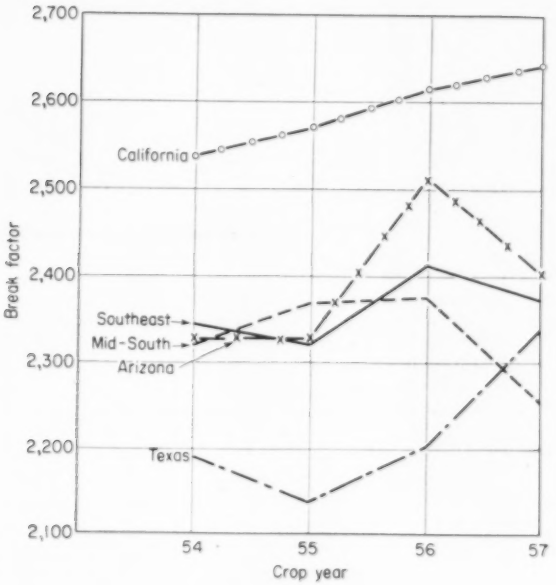
Yarn break factors in 1957 ranged from 2,252 in the Central states to 2,640 in California. Break factors in Texas and California compared favorably this season with 1956 early pickings. A substantial decline took place in the Central states.

Yarn-appearance indexes, compared with the previous season, held up satisfactorily in all areas.

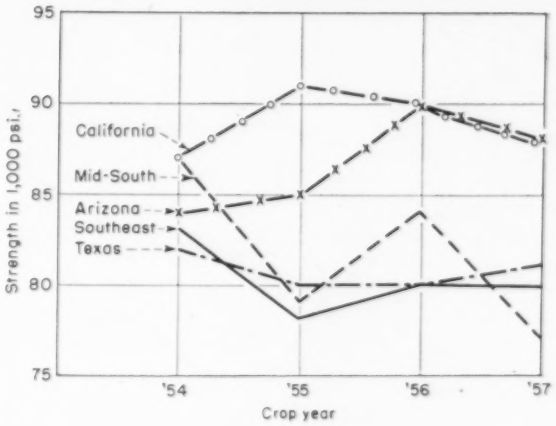
A significant reduction in neps was noted in California

*This article is based on data from USDA fiber and spinning tests. Because of changes in cotton varieties, testing procedures, and reporting methods, comparisons prior to 1954 have been dropped.*

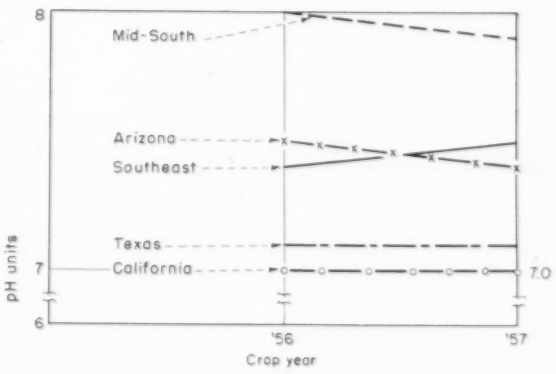
## YARN-SKEIN BREAK FACTORS



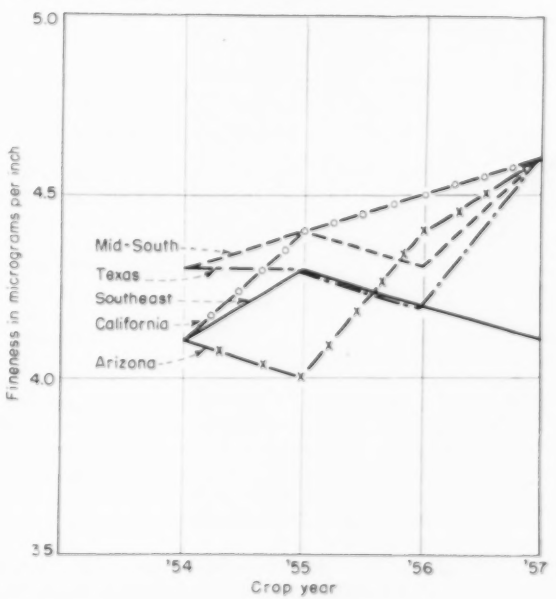

## FIBER STRENGTH BY PRESSLEY TEST




## ACID-ALKALINE VALUES




## FIBER FINENESS BY MICRONAIRE




and Texas. The 1957 cotton from these states, partly because of fewer neps, produced smoother yarns than the 1956 cottons. The highest nep counts prevailed in the Southeast and Arizona; the lowest were in California.

### Waste Down in California

Picker- and card-waste factors were important elements in 1957 spinning performance. There was less waste in California cotton because of better grades. There were some increases in waste cotton from Texas and Arizona; Southeastern cotton showed a slight reduction in waste.

The 7.4% waste figure for California is about the same as the average for Strict Middling cotton. The 8% figure for the Central states is equivalent to that associated with Middling cotton; the 8.7% figure for Arizona is between the Middling and Strict Low Middling used in the USDA tests.

The average grades of the early-season lots ranged from Strict Low Middling plus for the Central states to Strict Middling minus for California. Grades were inversely correlated with picker- and card-waste percentages for the different areas.

Compared with the 1956 early pickings, the early-season lots in 1957 showed no reduction in staple length. Increased staple length was observed in the Central states and Arizona.

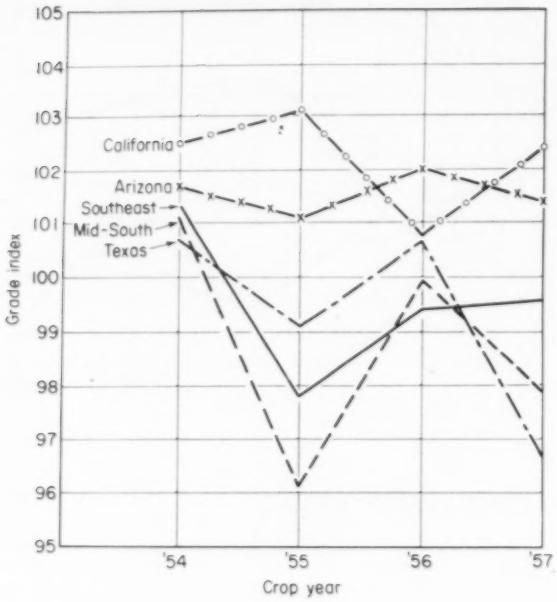
### Sugar Content Is Normal

Sugar content, as determined by quantitative chemical analysis, affects textile manufacture. High sugar content is associated with difficulties in processing and with lower yarn-appearance grades. A sugar content of 0.3% or higher is fairly well established as being the critical point.

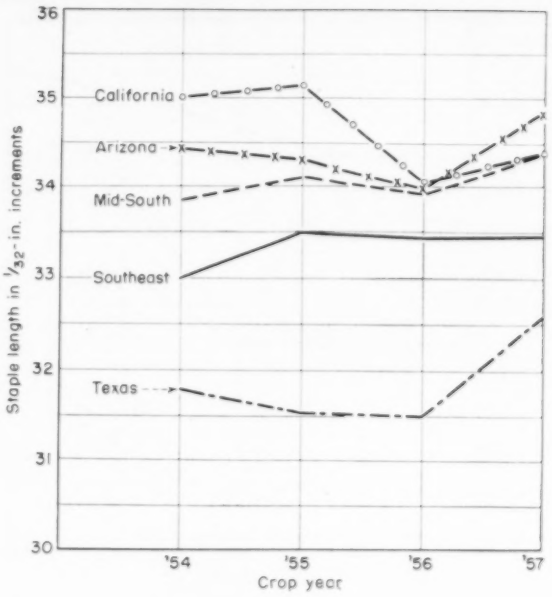
There is no evidence that any of the areas had dangerously high percentages of sugar. The Central states showed little or no presence of sugar.

Acid-alkaline value (pH units) in 1957 ranged from a low of 7.0 in California to 7.9 in the Central area. The value was low in Texas and medium high in Arizona and the Southeast. The same pattern held in 1956.

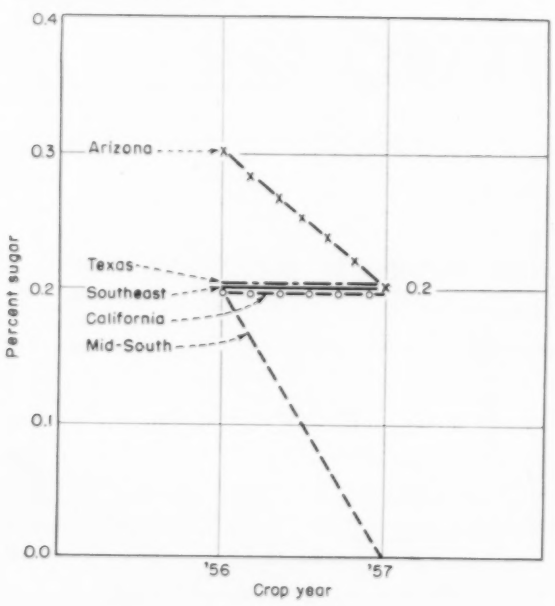
## COTTON-GRADE INDEXES



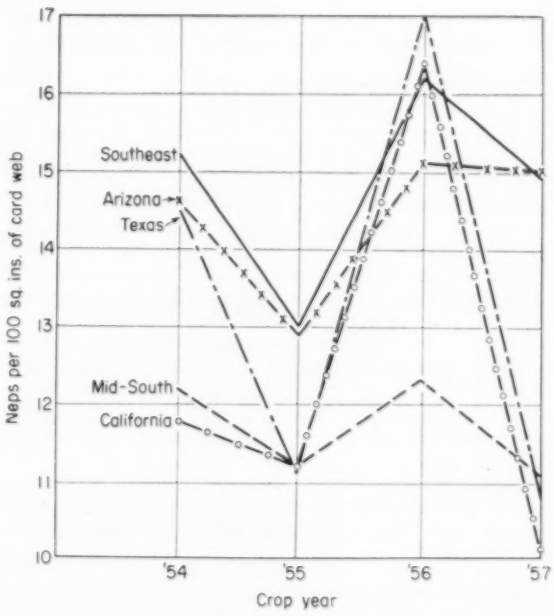

## COTTON STAPLE LENGTHS




## SUGAR CONTENT




## NEPS IN CARD WEB




Values above 7.0 when associated with low sugar content may indicate fiber deterioration from the action of micro-organisms. The only danger spot in 1957 was in the Central area. Mills using cotton from that area report the presence of Cavitomic fiber.

High moisture regain generally is considered desirable by mills that condition cotton at 92% r.h. While data are not yet available for 1957, the results of the regain tests for 1956 are of interest. Western cottons made the best showing in moisture regain, but no explanation for the difference has yet been found. The range was from 17.2% in the Mid-South to 18.2% in Texas, Arizona, and California.

### Comparisons Are Limited

Heretofore, early-season pickings generally were adequate to provide sound conclusions on the comparative spinning

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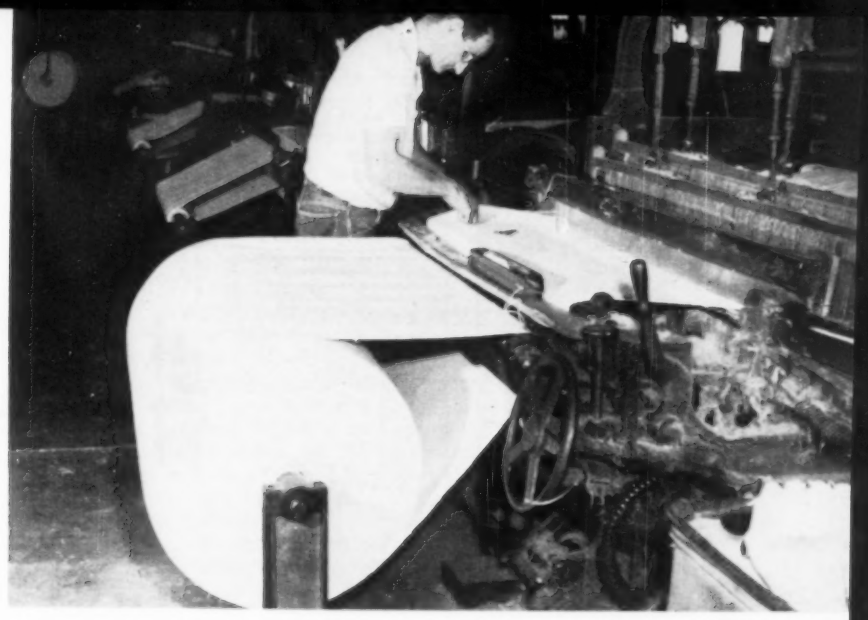

DUCK is still being woven on a number of the mill's looms.

# *Piedmont Cotton Mills* DIVERSIFIES PRODUCTION

• The failing market forced the curtailment of some heavy duck looms at Piedmont Cotton Mills, East Point, Ga.; but the mill entered other lines. Now it is not only resuming full weaving operations but is also adding additional looms and yarn-processing machinery.

THE COTTON-DUCK MARKET has been steadily diminishing for a number of years. The last prosperous periods for the duck mills were during World War II and the Korean conflict.

Plastics, nonwovens, coated fabrics, and metal have all invaded the duck market. There are still many places where duck is the best material, but its use is steadily decreasing.

Many duck mills have ceased operations or have changed over to more marketable lines. Some mills have added other types of fabrics to supplement their line of ducks.

Piedmont Cotton Mills, East Point, Ga., is one of the mills that decided to diversify. The mill had a number of heavy duck looms and also some light automatic duck looms, but they were not easily adapted to other fabrics; so some of the heavy duck looms were scrapped and 100 modified Model-D looms were bought.

Half of these looms are 40 ins. wide, and half are 32 ins. wide. The 40-in. looms are being started at a speed of 155 ppm., and the 32-in. looms will be run considerably faster.

The only change that is being made to these looms at the present time is a change-over from 24-in. to 28-in. beam heads. These larger heads will give the beams about 30% more yarn capacity. The mill's other looms are already equipped with the 28-in. beam heads.

The weave room is a single-story building with a concrete floor. The looms are mounted on wooden bases that are attached to the floor. The room has an atomizer-type humidification system with automatic controls.

### Warps Are Not Sized

Single-ply filling is spun on loom bobbins. Plied filling is twisted and wound on cops for the heavy looms and on quills for the automatic looms. The warps are not sized.

The weave room has an overhead monorail conveyor system. Both full

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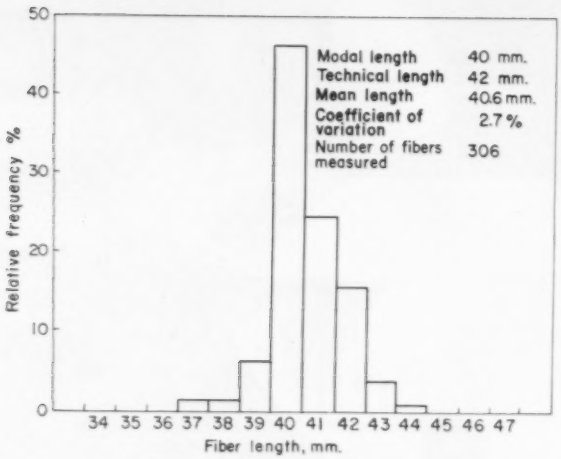
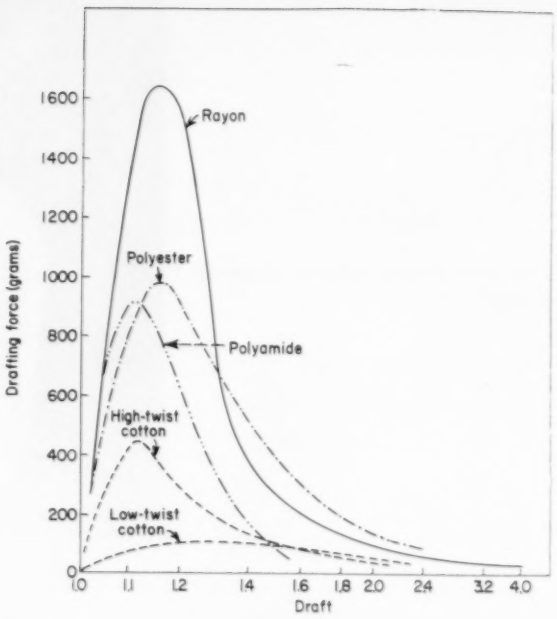
LOOMS are being set up to weave a variety of plain fabrics.




THIS FREQUENCY DISTRIBUTION of a 1.5-den. 40-mm. rayon staple fiber is an example of an undesirable variation in fiber length beyond the model length of 40 mm.




COMPARISON of the drafting force versus draft for slubbing of various fibers shows that in the region of high drafting forces, cotton shows relatively low values.

# Five Properties That Affect MAN-MADE-FIBER Processing

- Five properties of individual fibers that influence processing of man-made fibers include length, thickness, geometrical structure, surface layer, and inside structure
- Better processing can result from tests made to determine the collective-fiber properties, which include the measurement of sliver strength and drafting forces

EXISTING SPINNING TECHNIQUES of man-made fibers are based on the length and thickness of the fibers to be spun. There are, however, five properties of the individual fibers that determine their behavior during processing.

These properties are length, thickness, geometrical structure, surface layer, and the inside of the fiber. The geometrical structure consists of the length structure, the cross-sectional structure, and the surface structure.

Techniques have been developed at Algemene Kunstzijde Unie, Arhem, Holland, to measure some of these properties. Collective-fiber properties are measured with sliver-strength and drafting-force tests.

*Adapted from a paper presented by Dr. H. L. Roder, Algemene Kunstzijde Unie, Holland, at the joint meeting of The Fiber Society and The Textile Institute in Boston, Mass.*

Length and thickness of fibers are so important that all existing spinning systems can be classified according to the length and thickness of the fiber they are meant for. These systems are usually identified by the fibers for which they have been developed.

For man-made fibers, the measurement of the length of individual fibers is preferred to the measurement of a bunch of fibers. We used a set of special rulers to measure the length of individual fibers.

We prefer the modal length to be used for identifying man-made-fiber lengths. A staple fiber may be sold as 60 mm., while the modal length turns out to be 56 mm. This difference is caused by shrinkage during processing after the fiber has been cut.

Fibers longer than the modal length are not desirable, although a few of them may not cause a catastrophe. The technical length comes in useful here. The technical length is that fiber length that contains the limit beyond which 5% of the longest fibers in the staple diagram is situated. This technical length should not differ more than one class from the modal length.

In the worsted system, blending of fibers with different fiber lengths is to be preferred over spinning fibers of only one nominal length. For instance, a blend of 80-, 100-, and 120-mm. fibers is preferred over fibers of 80 or 100 mm.

The length structure indicates the over-all shape of the fiber in the direction of its axis. This property is usually indicated as waviness or crimp.

Several methods are used to measure crimp. The most widely used is the method that indicates the number of waves per centimeter of fiber.

Another method measures the amount of energy applied in uncrimping the fibers. By elongation of an individual fiber at increasing loads, a

value for the intensity of the crimp can be calculated.

By comparing the energy after one partial loading with the same fiber after the fiber has been loaded to a higher tension, the stability of crimp can be obtained. The values for intensity and stability of crimp vary widely in different fibers.

In rayon staple, the values for the stability of crimp are much lower than in polyamide and polyester fibers. Cotton-type fibers are characterized by a lower intensity than fibers meant for the woolen or worsted system.

To illustrate the importance of crimp, two lots of nylon were processed. The lots were identical except for the crimp. The crimp in the first lot amounted to 6.5 waves per centimeter, and the second lot had two waves per centimeter.

Although the lubricating agent and coefficients of friction were practically the same in both lots, the second lot could not be processed successfully because of excessive breaks on the combs and drawing frames. The breaking strength of the sliver was much higher in the first lot, and the yarn evenness was also greater.

During the conversion of the fiber into yarn, some crimp is eliminated. In some fibers this difference is considerable. In one test, the original fibers before spinning showed an intensity of 38 while the intensity dropped to 20 when the fibers were withdrawn from the yarn and tested.

This crimp, however, is partly recovered after a relaxation treatment such as scouring or heating. This capacity of the fiber to partly recover its crimped structure determines many properties of the yarn in fabrics made from them.

The cross section of a fiber is of great importance to the fiber behavior during processing. The shape may vary from a perfect circle to a rather haphazard shape.

The geometrical surface exhibits such forms as scales that are seen on wool fibers. On man-made fibers, there are marks on the surface caused by pigment or dyestuff particles or holes caused by the evaporation of volatile components during drying.

No limit can be specified for these microscopic surface-structure effects, which are of great importance in spinning. The more powerful the optical or electron equipment used to view these effects, the more details can be seen.

When fibers rub against each other, small amounts of lubricants are important. The processing qualities of natural fibers are partly determined by their natural lubricating agents.

Extraction is the usual technique to determine the amount of lubricating agent on the fiber. Different types of fiber require different amounts of lubricating agent.

The amount should remain below 0.6% for cotton-type staple. Higher amounts lead to filling of the card clothing and clinging of the fibers to the rolls during drawing.

Amounts of lubricant up to 2% are allowed for the worsted system, and even higher amounts are permitted for the woolen system.

The lubricating agent should be evaluated for use on a chosen type of fiber. Because the effect of a lubricant on a fiber surface depends on the interaction of the agent and the fiber surface, the same agent may give different effects on different fibers.

For instance, cation-active agents have a marked effect on rayon staple, which results in a considerable decrease of static friction. This effect is absent when the agent is applied on polyamide fibers. The reverse applies to anionic agents.

Higher amounts of lubricants are required for the satisfactory processing of finer fibers. Crimped fibers require a more effective lubricating agent than a noncrimped fiber.

The inside of a fiber is important because a fiber that is too weak, too brittle, or too stiff cannot be processed successfully. The inside of a fiber is equally responsible for the behavior of a fiber toward humidity and so contributes to spinning properties.

The inside of the fiber is also responsible for most of the properties of the cloth made from the fiber. These properties include durability, abrasion resistance, tenacity, bending, melting point, crease resistance, and washfastness.

These properties of individual fibers are useful in studying the behavior of fibers in processing; but these fibers interact during processing, and some quantitative measurements are also required. We made tests on sliver strength and drafting forces to give us information on the collective behavior of fibers.

Special clamps were developed to hold the sliver in a pendulum tester. Interesting information can be gained from the shape of load versus elongation curve, such as the presence or absence of stick-slip effects.

Introduction of a weak twist such as one turn per 20 cm. will intensify the appearance of stick-slip effects if they are present. The amount of coherence in slivers and roving can also be investigated. A sliver-strength test is useful as a simple, quick routine control test and can be used to obtain information on special lots of fiber.

Because drafting forms the essential element in the conversion of fibers into yarn, measurement of the forces generated during drawing of sliver and roving can supply useful information on fiber properties. We developed an instrument that gives precise measurements of drafting forces of slivers and rovings under conditions identical to drafting on a three-roll drawing frame.

Certain low drafts lead to relatively high drafting forces. In spinning, drafts of 1.2 to 2 should be avoided. Processing rayon staple on the spinning frame can be improved by eliminating the top roll of the first drafting zone and using a two-roll drafting zone instead of a three-roll drafting field.

Processing of polyester-and-rayon blends on a two-line drawing frame by drafting in one zone gives an improvement in regularity of draw-frame sliver compared with two-zone drafting. This process applies to fibers that have been combed or passed through one draw-frame passage.

Avoiding low drafts is even more beneficial in processing polyester and polyamide fibers than in processing rayon.

Drawing forces increase with an increase of the twist multiplier. Rayon rovings often showed slip in the first drawing zone. This roving was measured on our instrument in such a way that the first drafting zone was put out of action. A sharp rise in drafting force was registered when the draft was increased.

At drafts greater than 1.2, the drawing force sometimes dropped to a much lower level. At drafts over 1.6, the high-level forces were not found. At drafts between 1.2 and 1.6, either no drafting occurs at all, and consequently the roving slips through the rolls, or ordinary draft takes place.

### Crimp Affects Drafting Force

The amount of crimp in a fiber is clearly reflected in the behavior in drawing. We found that the drawing force was greater as the intensity of crimp increased.

In measuring the drafting forces of long-staple fibers, we used an intersecting gill box. We discovered that polyester fiber that had been dyed black gave better processing results than the undyed fiber. We also found that 4.5-den. fibers processed better than 3-den. fibers.

In tests with 100% polyamide and polyester fibers and blends with wool, we found that 100% man-made fibers benefitted from the three-passage system, while wool gave better results with the five-passage system. The five-passage system also proved better for blends of wool and the man-made fibers.

# How You Can Plan A LUBRICATION PROGRAM

The keystone services that bridge the gaps between the theory and fact of lubrication are—

- Objectives and planning of a program
- Methods and technical data of procedure
- Supervisory control of performance

A PLANNED LUBRICATION PROGRAM is the only efficient method for constantly integrating the latest lubrication developments into an ever-expanding industrial economy.

The first objectives of such a program are to (1) reduce the cost of lubrication, (2) prolong the life of equipment, (3) minimize downtime, and (4) increase plant production.

Your first and most important step in establishing a lubrication system is to impress on every employee to be connected with the program that the job must be done thoroughly.

A primary and simple step toward a sound maintenance program is the proper application of oils and greases to plant equipment. But it is not so simple to put such a practice into operation.

It is not enough to give a man a grease gun and tell him he is to lubricate machinery in a given area. Proper organization is to supervise the lubrication program from the purchase of the lubricant to the final application.

### Good Results Come From Planning

Progress in your lubrication program will require planning. This planning requires determination of methods, budgets, jobs, people, and flexibility.

In organizing a program, you must decide on the types of organization units, define the relationship between them, select your employees, define duties, issue instructions, and administer the entire effort.

Good plans can be developed only through careful, diligent work by several people. The more detailed the attention that is given to planning, the less detail is required for control of execution.

The following steps must be taken: (1) job descriptions; (2) classification and control of lubricants (including acceptance testing); (3) detailed inventory of operating equipment and its location, with the necessary operating and maintenance manuals; (4) lubrication instructions; (5) identification of lubricated points; (6) lubrication standard guides for various types of friction points; (7) lubrication schedules; (8) supporting programs; and (9) adequate engineering data.

### Organization Has Two Phases

Your organization will be divided into two phases: paper and people.

The paper phase is static or structural. It is a definition, usually in chart form, of the scope and level of responsibility of each function, channels of command, interrelationships between functions, etc. This chart in turn is shown as three charts: (1) the actual organization structure as it functions, (2) the desired structure for the present, and (3) the future or growth structure.

In the paper phase, it is important to describe each job adequately. Similar duties should be assigned to the same job to the greatest possible extent, and there should be the greatest possible distinction between different jobs. These two features will permit optimum integration and correlation of all jobs in the program.

The people phase of organization is essentially administration and is difficult to present in chart form. It deals with objectives, policies, procedures, direction, coordination, and human relations.

The program should be arranged in such a clear-cut manner that each man is able to go ahead and do his job on the basis of his instructions with minimum further questioning. It involves training, scheduling, reporting, and follow-up.

The need for direction tends to decrease as the standardization of methods and conditions increases.

Classification and control of lubricants are important steps in a lubrication program. Classification or coding is necessary, both when a program is being developed and when it is completed.

The general requirements of a coding system are to (1) be adaptable to machine bookkeeping for correlating to other codes for recording various statistics, (2) arrange listings of similar types of materials, (3) cross-index the many products supplied by numerous suppliers, and (4) indicate possible substitutions from alternate sources.

### Coding Cuts Lubricants in Stock

When we started the coding system at our plant, we had about 140 different lubricants in stock. There were instances of as many as five oils with the same specification, each from a different supplier. There were other instances of inferior oils with similar viscosity to better grades of oils.

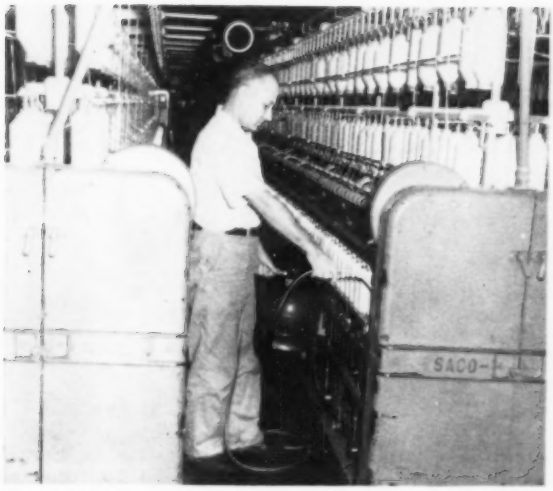
A second survey of stores was made at the end of three months. During this period, new codes were developed and assigned. From 90 to 95% of all lubricants were covered by approximately 20 lubricant items. These 20 lubricants include several special products formulated to our unusual requirements; others are various formulations of solid lubricants such as graphite.

Codes are used whenever possible to specify lubricants, apply them in the plant, requisition them for stores, and order them from suppliers. One requirement of the specifications is that each new container be labeled with our code when it is delivered.

The lubricant is tested to the re-

CONTINUED ON PAGE 95

*Based on a paper given by Tell Martin, Union Carbide Nuclear Co., at a conference of the American Society of Lubrication Engineers, a branch of the American Society of Mechanical Engineers*



PRODUCTION MACHINES are lubricated by central-lubrication employees. Here, J. E. Joiner removes spindle oil from a spinning frame with a pneumatic spindle-oil remover.

LUBRICATION EQUIPMENT makes the job fast and easy. Spindles are oiled with this electric oiler. This job, as are all lubrication jobs, is done by written schedule.

# *Avondale Mills Has*
# *CENTRAL LUBRICATION*

**An eight-man crew working under the mill master mechanic oils and greases production machines at one of Avondale Mills' yarn and cloth mills. The system results in—**

- **Low inventory of lubricants**
- **Better oiling methods**
- **Improved production-machine operation**

**By JAMES W. WARD,** Electrical Engineer, Avondale Mills

A CENTRAL-LUBRICATION PROGRAM at Avondale Mills' Bevelle Plant, Alexander City, Ala., has been in operation several years. All production machines in the mill except spoolers are lubricated by the lubrication department. The large mill is completely integrated from cotton opening through weaving, and approximately 600,000 yds. of fancy fabrics are produced each week.

The lubrication department consists of a head oiler and seven oilers and is under the direction of E. R. Ray, master mechanic at the mill. Mr. Ray coordinated the work assignments and is liaison between mill department heads and the oilers. This work includes receiving suggestions and complaints and discussing oiling changes with department foremen.

The entire lubrication crew works on the first shift to permit better supervision and closer working relationship between oilers.

### Each Oiler Is Trained Thoroughly

Each member of the crew has been trained for all lubrication procedures. First, the head oiler gave each oiler personal instructions. Then each man was assigned to an experienced oiler for a week to 10 days of on-the-job training. During the training period, the head oiler observed each trainee's progress closely.

Each oiler works from a written daily schedule that lists the type of equipment, number of machines to be lubricated, and brand name and type of lubricant to be used.

In most instances, the schedule lists the machine numbers to be oiled during a given day to designate the daily position of the oiler and to facilitate the coverage. With this schedule, each machine is lubricated regularly and at a predetermined time.

Assignments of the seven oilers are:

No. 1–Lubricating (greasing or oiling) electric motors and miscellaneous equipment

No. 2–Lubricating drawing and roving frames

Nos. 3 and 4–Oiling and greasing looms

PLEASE TURN THE PAGE

LUBRICANT STORAGE is in a masonry building 30x40 ft. in area. Only about 20 types of lubricant in three brand names are kept. They replace 60 types formerly used.

WEEKLY CONFERENCE of all oilers, the head oiler, and the master mechanic is held to discuss schedules and problems. As a result, many improved methods are created.

No. 5—Oiling and picking spinning-frame rolls

No. 6—Oiling spinning frames

No. 7—Oiling spindles on spinning frames

These assignments pin down responsibility to oilers and are reviewed by the master mechanic and head oiler once each year. But any change needed is discussed and adopted at any time.

There is a 15-min. conference of all oilers, the head oiler, and the master mechanic each Wednesday. Oiler assignments for the coming week and new problems are discussed. Oilers are encouraged to make suggestions; many improved methods have been suggested by the men.

### Scheduling Eliminates Records

This method of scheduling with direct supervision keeps the work moving. And since the head oiler knows the schedules and sees them followed, detailed records are eliminated.

Detailed records of each job would increase the efficiency of the department, but not to a justifiable extent.

Only one record is made: a list of the work done by each oiler each day is made by the head oiler and is given to the master mechanic. From this list and from the daily schedule, a check is made on the performance of all lubricants.

The physical-property requirements of the department are not large. There is a 30x40-ft. oil house in a separate building where most of the active lubricants and all of the inventory lubricants are stored. Special oils used in large quantities are stored in the areas where they are used. Each oiler is responsible for the condition of the oil-storage equipment in his area; all of these areas and the oil house are kept spotlessly clean.

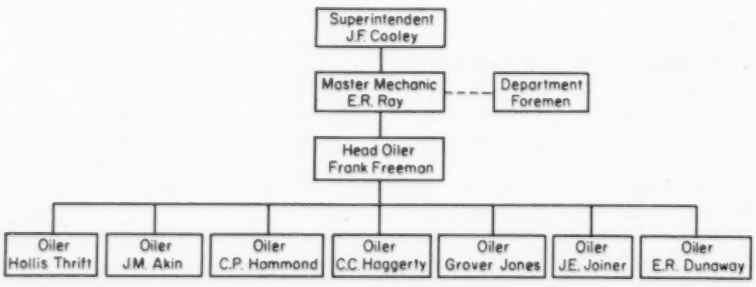
Equipment used is regular grease guns and oil cans, an electric spindle oiler, pneumatic spindle-oil changer, and electric and pneumatic machines to apply dope.

Types of lubricants and frequency of lubrication are determined primarily from machinery manufacturers' instruction booklets and lubrication-data charts. Spindle oil, for example, is changed every six months.

Further recommendations were made by three oil companies who made surveys in the mill. These surveys included the entire mill; and in most instances, they listed substitutions of lubricants specified by machinery manufacturers. The oil companies also gave valuable information for lubricant applications where manufacturers' instructions were missing.

The master mechanic and head oiler decide what lubricants are to be used. No attempt has been made for complete standardization, but one applicable brand name and type is used throughout the mill on similar end uses. Approximately 20 types of lubricants in three brand names are used at present.

A minimum inventory is kept. The head oiler checks inventory each morning and reports it to the master mechanic.




ORGANIZATION CHART starts with the mill superintendent and goes down. The master mechanic is liaison between the oilers and all department foremen in the mill.

### Methods Change Continuously

Electric-motor lubrication has undergone many changes since the lubrication program was organized. Now a check is made semiannually. In the past, the motors were checked quarterly; an annual check is now being considered.

The present semiannual check is: the end bells are removed, and the condition of the bearings and lubricant is inspected on a representative number of motors in each mill department. Mill electricians help with the inspection.

**If the check indicates a need of lubrication,** the oiler follows his written schedule. The present schedule is: (1) remove the bottom plug, (2) insert grease at the top until fresh grease runs out the bottom, and (3) replace the bottom plug. The old grease is caught in a small cup.

Sealed-bearing motors for spinning frames are also included in the inspection. But to date, these motors have given excellent service and lubrication has not been necessary.

The head oiler thoroughly inspects all machines in an area after a plant fire to determine if lack of lubrication caused the fire.

### New System Improves Operation

Before the central-lubrication department was organized, each mill department lubricated its own machines. And in most departments, lubrication was a part-time job.

Where only about 20 lubricants are used now, approximately 60 were used before. Lubricants were stored in each department of the mill with resulting untidiness and safety hazards.

The main benefit of the present central system is that the work is done under close supervision with proper authority. There is a definite improvement in production-machine operation. Mill Superintendent J. Freeman Cooley says, "Central lubrication is one of the best improvements we have made in our mill."

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## PLANNING A LUBRICATION PROGRAM

CONTINUED FROM PAGE 92

quirements of the code before it is accepted.

Lubricating employees draw a lubricant from our stores department by code. Then they fill their various pieces of lubrication equipment and apply the lubricant to designated lubrication points, all of which are identified by coded decals. In theory, this system gives absolute control over lubrication; in practice, it is endangered only by human frailty.

Now the control of lubricants is largely a practice of following established procedures and is made possible by the cooperation of all employees.

A list of approved materials, by supplier and brand names, is attached to each specification. These materials are not the only ones that might meet a given specification, but they are the ones that have been examined and approved.

If the low bid to a given specification offers a material that is on the approved list, our purchasing department automatically buys it. But if the low bid is not on the approved list, steps are taken to approve or disapprove the material if the quantities and savings involved justify the cost of such action. The lubrication engineer evaluates the test results and approves or disapproves any lubricant.

The next step in your lubricating program is to secure a detailed inventory of all operating equipment in your plant. This survey includes all equipment and extends, for example, to even a remote wall-mounted exhaust fan that may be covered up by a duct 50 ft. above the floor.

When this equipment has been identified by manufacturer, type, operating conditions, etc., you should secure the manufacturer's maintenance manuals and operating instructions for your central-lubrication files.

### Lubricant Points Are Identified

For lubrication instructions to be effective, each lubrication point must be known and identified by location and operating conditions. The correct lubricant must be assigned by type, quantity, and frequency.

These instructions may be prepared on a written standard form for simple equipment such as pump units that consist essentially of an electric motor, flexible coupling, shaft bearings, and packing.

For more-complex mechanisms that may have two or more power trains and numerous lubrication points, you should use the written instructions on the standard form. Also, make outline views of the machine with arrows pointing to the lubrication points.

At our plant, we place a number in a circle at the ends of these arrows; the number corresponds to a numbered line in the written portion of the lubrication instructions. The instructions for each point include the name of the point, frequency of lubrication, type of lubricant used by code, and terse lubrication instructions.

Lubricated points on the machine are identified by a water-transfer silicone decal placed by or above the exact point. This decal is a bright-colored red or yellow background with two black block letters that specify the proper lubricant. A red decal designates grease points; yellow designates oil points.

Preparation of lubrication schedules is the final control step in a program. Use your equipment inventory and divide your plant into segments by process, geographical area, and type of supervision you will need as shown by your table of organization.

Then list all the equipment in a given area by manufacturer and type on a prepared form. For each type of equipment, list the lubrication points. Then list lubrication frequency by shift, day, week, month, or year or by dates in between.

When this information is compiled for all equipment, make your daily schedules. Only the points to be lubricated on a given day are shown on the daily schedule sheet. The schedule shows the number of points that can be lubricated in an 8-hr. day.

You must have a lubrication engineer to head the entire program. He must plan, organize, and control the program.

His job includes the following work:

1. A periodic review of stores to eliminate duplication, unnecessary items, or low-usage items
2. Maintenance of a simple comprehensive lubricant-coding system as a guide to buying, testing, issuing, and applying lubricants
3. Preparation of lubrication instructions in the form of lubrication charts for complex equipment
4. Maintenance of standard lubrication schedules
5. Investigation of the feasibility of installing centralized-lubrication systems
6. Decisions on the feasibility of less frequent lubrication of grease-lubricated bearings
7. Maintenance of current information on market and market developments
8. Maintenance of current technical data on all phases of lubrication theory, techniques, and problems
9. Establishment and installation of an acceptance-testing program for oils
10. Preparation and conduct of technical sessions for lubrication employees
11. Trouble shooting on mechanical failures and investigation of special problems related to failures

# Follow These Pointers To WEAVE WOOLEN TWEEDS

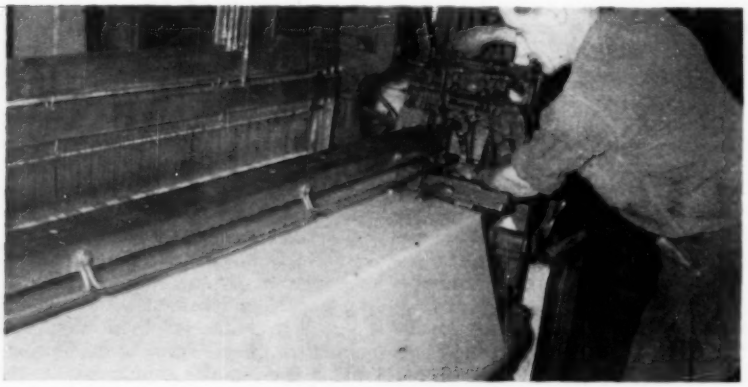
• It's not easy to weave high-quality woolen tweeds and herringbone patterns on automatic looms, but skillful use of equipment and methods will produce fabrics comparable to hand-loomed varieties.

• Here are some pointers on what to do—

By **EUGENE P. SCHREMP,** Consulting Editor, TEXTILE WORLD

MOST WOOLEN MILLS have found that when they weave fabrics similar to hand-loomed Harris tweeds, special attention is needed to prevent a high percentage of seconds. Fabrics made with white warp yarn using black or dark filling and finished with little or no fulling show manufacturing defects very clearly in the finished fabric.

The type of loom to be used is very important. A 4x1-box automatic loom weaves with two consecutive picks from each bobbin. The same shuttle must cross and return. Any unevenness in size or shade in the filling is accentuated by two filling ends side by side. Using three or four shuttles may help spread any unevenness and will help the filling to blend evenly, provided the filling is not uneven to any great degree.



LOOMS must be set correctly to prevent light and heavy places in the fabric.

TAKE-UP ROLL fillet should be in good condition to hold the cloth securely.

There is another school of thought shared by some textile manufacturers that any unevenness of filling that may show when two shuttles are used will also show when three or four shuttles are used. These mill men say that using more shuttles will only spread the imperfection over a greater distance in the woven fabric. There has also been a difference of opinion on the best method of shuttle sequence in weaving with three shuttles.

### This Box Motion Easy on the Loom

Building the box chain to give a sequence of 1-2-3-2 indefinitely gives a box motion without any two box jumps and is very easy on the loom. The disturbing factor of this method is that you get twice as many picks from No. 2 shuttle as from No. 1 and No. 3. This sequence puts more filling from No. 2 shuttle in the fabric, and any variation in that bobbin will have a chance to show more clearly in the finished fabric.

Unless the filling magazine is equipped with a cell selector, the No. 2 cell will have to be replenished with filling twice as often as No. 1 and No. 3 cells. This condition will make the operation of filling the magazine a little more difficult, especially when heavy woolen filling is used on tweed-type fabrics.

Another method using a 1-2-3-1-2-3 box motion eliminates the extra picks from No. 2 shuttle, but a jump or

CONTINUED ON PAGE 174

New Data on—

# How 8 Fibers Compare In STRESS-STRAIN Properties

- How a fiber behaves when it is pulled or stretched has a great deal to do with its performance in yarn and fabric. So a knowledge of fiber behavior under stress is important to everyone in textiles.
- Here are new research findings on these fiber characteristics—and a brief rundown on how you can use this information.

**By J. F. de BORDENAVE, D. J. BRINGARDNER, and H. T. PRATT**

Technical Service Section, Textile Fibers Dept., E. I. du Pont de Nemours & Co., Inc.

FROM THE TIME A FIBER ENTERS A TEXTILE MILL until the fiber product is worn out or discarded, the fiber is being pulled and stretched at frequent intervals. To realize this fact, one has only to think of the nature of the mechanical actions that occur in spinning, throwing, fabric finishing, the bending of a trouser knee, or in towing with a rope.

These pulls on the fiber and the stretching that results are often referred to as stresses and strains. Any pull or stress that tends to stretch the fiber in only one direction is called a tensile stress. Thus, how a fiber behaves when it is pulled or stretched is the same as its tensile stress-strain properties.

Some of the important tensile stress-strain properties of a fiber can be shown graphically with the aid of a stress-strain curve. Examination of the shape, position, length, and height of the curve can provide much useful information about such fiber properties as tenacity, elongation, toughness, and resistance to stretching.

## Stress-Strain Properties

### Tenacity

Tenacity is the pull or tensile stress on the fiber per unit denier. Tenacity is determined along the vertical axis of the stress-strain chart.

Breaking tenacity is the tenacity at the point of fiber rupture. Obviously, a fiber with a high breaking tenacity is needed where high strength is a requirement in fabrics or yarn.

### Elongation

Elongation is the stretch or strain in a fiber as shown by increase in length. Elongation is measured along the horizontal axis of the stress-strain chart.

The breaking elongation is the elongation at the point of rupture. This property is important because a fiber with a high breaking elongation is needed in fabrics or yarns that must withstand large deformations without breaking.

### Toughness

A tough fiber is one that can take severe punishment up to the point of breaking. Toughness is measured by the work required to break the fiber and is determined by the total area under the stress-strain curve. The larger this area, the greater the work to break, or toughness. Work to break is indicative of the flex life, abrasion resistance, and shock absorbency of the fiber.

### Resistance to Stretching

The resistance of a fiber to stretching is shown by the stress or tenacity that is needed to elongate the fiber by a given percentage. It is a measure of the fiber's ability to resist deformation and can be determined by observing the slope or direction of the stress-strain curve. The more nearly vertical the curve, the greater the fiber's resistance to stretching.

For the most part, fibers in apparel, household items, and many industrial products are elongated only a small amount. In such cases, only the initial portion of the stress-strain curve need be considered. Resistance to stretching is an important factor in processing and is related to such fabric properties as drape and hand.

The stress-strain properties dealt with here are not the only important fiber properties. In many cases, other mechanical properties may be equally or more important; for example, the ability of the fiber to recover from deformations such as those encountered in wearing apparel.

## How Mills Can Use Stress-Strain Data

All of a fiber's properties can be called into play at some time during the life of the fiber. Accordingly, a combined knowledge of end-use requirements, processing conditions, and fiber properties will help the fabric designer select the most suitable fiber for a particular end use and the mill man to do the best job of making the product. The following examples show how stress-strain properties are applicable in a few textile operations.

### Yarn Manufacturing

In opening, picking, and other early stages of yarn manufacturing, fibers are subjected to rugged treatment. Tough fibers can withstand this vigorous working without damage. With fibers of low stretch resistance, high roving twists and close ratch settings can cause tight picks and ends in finished fabric.

Cockling is more likely to be a problem with high-tenacity staples having a high breaking elongation and low stretch resistance.

### Throwing

Throwing consists primarily of a series of yarn transfers from one package to another. The yarn is under tension; and as is well known, variations in tension in filament yarns can cause such quality problems as warp streaks, filling bands, barré, or quill junctions in finished fabric.

Tension levels based on a knowledge of the stretch-

resistance properties of the fiber being handled can eliminate many throwing problems, particularly if fibers with relatively low stretch resistance are being used.

With the introduction of heat or moisture, as in sizing, it is usually necessary to handle the yarns more carefully, since both heat and moisture reduce the stretch resistance of fibers.

#### Dyeing

With so much of the work of dyeing taking place under variable conditions of heat and moisture, fabrics and yarns are extremely susceptible to distortion in the dyeing process. Therefore, careful consideration must be given to the fibers in each piece of goods being dyed. The stress-strain properties at the dyeing conditions must be known to visualize how well the fiber will withstand the necessary mechanical handling. For example, Orlon stretches quite readily in a hot bath; and skein-dyed yarns must be cooled before being lifted from the bath. Otherwise, the yarns lose their bulkiness.

#### Weaving

Close attention to the adjustment of tensions is necessary in controlling the tightness of the ends and picks in woven fabric. The fact that the stretch resistance of fibers varies should be considered in quill winding and warp preparation and in making loom adjustments.

It is also important to emphasize that the tension required to stretch a given fiber varies with the amount of stretch. Therefore, better tension adjustments can be made by a study of how stretch resistance varies with tension level.

#### Knitting

Proper tension control is the key to quality knitting. Stitch formation, quality of dyeing, and fabric stability are all dependent to a great extent upon the fiber's tensile properties; that is, resistance to stretching. Because of the low tension involved and the wide variation in the stretch resistance of fibers at low elongations, critical attention must be given to the knitting machine when it is changed from one fiber to another.

### New Comparative Data

The data presented here are from the third phase of a broad fiber-characterization program sponsored by the Du Pont Company at North Carolina State College. In this phase, stress-strain properties were determined under a variety of conditions for acetate, "Dacron" polyester fiber, nylon, "Orlon" acrylic fiber, textile rayon, "Super Cordura" high-tenacity rayon, cotton, silk, and wool.

Since the stress-strain properties were determined in the same way and the curves all drawn to the same scale, the relative merits of each fiber can be determined at a glance. The following are examples of what the charts show:

**STRESS-STRAIN PROPERTIES AT STANDARD CONDITIONS**

| | | |
|---|---|---|
| Breaking tenacity | Low | Merino wool, 1.02 gm. per den. |
| | High | 840-140-300 nylon, 6.66 gm. per den. |
| Breaking elongation | Low | Deltapine and Coker cotton, 8.6% |
| | High | Nylon staple and tow, 61.3% |
| Work to break | Low | Coker cotton, 0.06 gm. cm. per den. cm. |
| | High | Nylon staple, 1.74 gm. cm. per den. cm. |
| Tenacity required to elongate by 1% | Low | Nylon staple, 0.16 gm. per den. |
| | High | 100-40-81 Orlon, 0.95 gm. per den. |
| Tenacity required to elongate by 3% | Low | Nylon tow, 0.36 gm. per den. |
| | High | Silk, 1.67 gm. per den. |

### Effect of Relative Humidity

With an increase in relative humidity:

1. Breaking tenacity increases for cotton, remains about the same for Dacron, and decreases for the other fibers.
2. Breaking elongation remains about the same for Dacron and nylon and increases for the other fibers.
3. Work to break increases for cotton, remains about the same for Dacron and wool, and decreases for the other fibers.
4. The tenacity required for elongations of 1%, 3%, 5%, and 10% remains about the same for Dacron and decreases for the other fibers.

### Effect of Water Temperature (70° F. to 210° F.)

With an increase in water temperature:

1. Breaking tenacity decreases for all fibers.
2. Breaking elongation remains about the same for rayon and silk and increases for the other fibers.
3. Work to break remains about the same for Dacron and wool and decreases for the other fibers.
4. The tenacity required for elongation of 1%, 3%, 5%, and 10% remains about the same for wool and decreases for the other fibers.

### Effect of Air Temperature (–70° F. to 400° F.)

With an increase in air temperature:

1. Breaking tenacity decreases for all fibers.
2. Breaking elongation remains about the same for rayon, cotton, and silk and increases for the other fibers.
3. Work to break remains about the same for Dacron and wool and decreases for the other fibers.
4. The tenacity required to elongate the fibers by 1%, 3%, 5%, and 10% decreases for all fibers.

### Loop-Stress-Strain Properties

The loop breaking tenacity, loop breaking elongation, and loop work to break of many of the fibers were considerably lower than the values obtained in straight stress-strain tests on the same fibers. The greatest reductions were obtained with rayon and acetate.

Approximately the same loop and straight stress-strain properties were obtained with Type 56 Dacron, Type 55 Dacron, and nylon tow.

The initial part of the loop stress-strain curve was nearly the same as that of the straight stress-strain curve for the same fiber sample; and for most of the fibers tested, approximately the same tenacities at 1%, 3%, 5%, and 10% elongations were obtained.

### Other Data

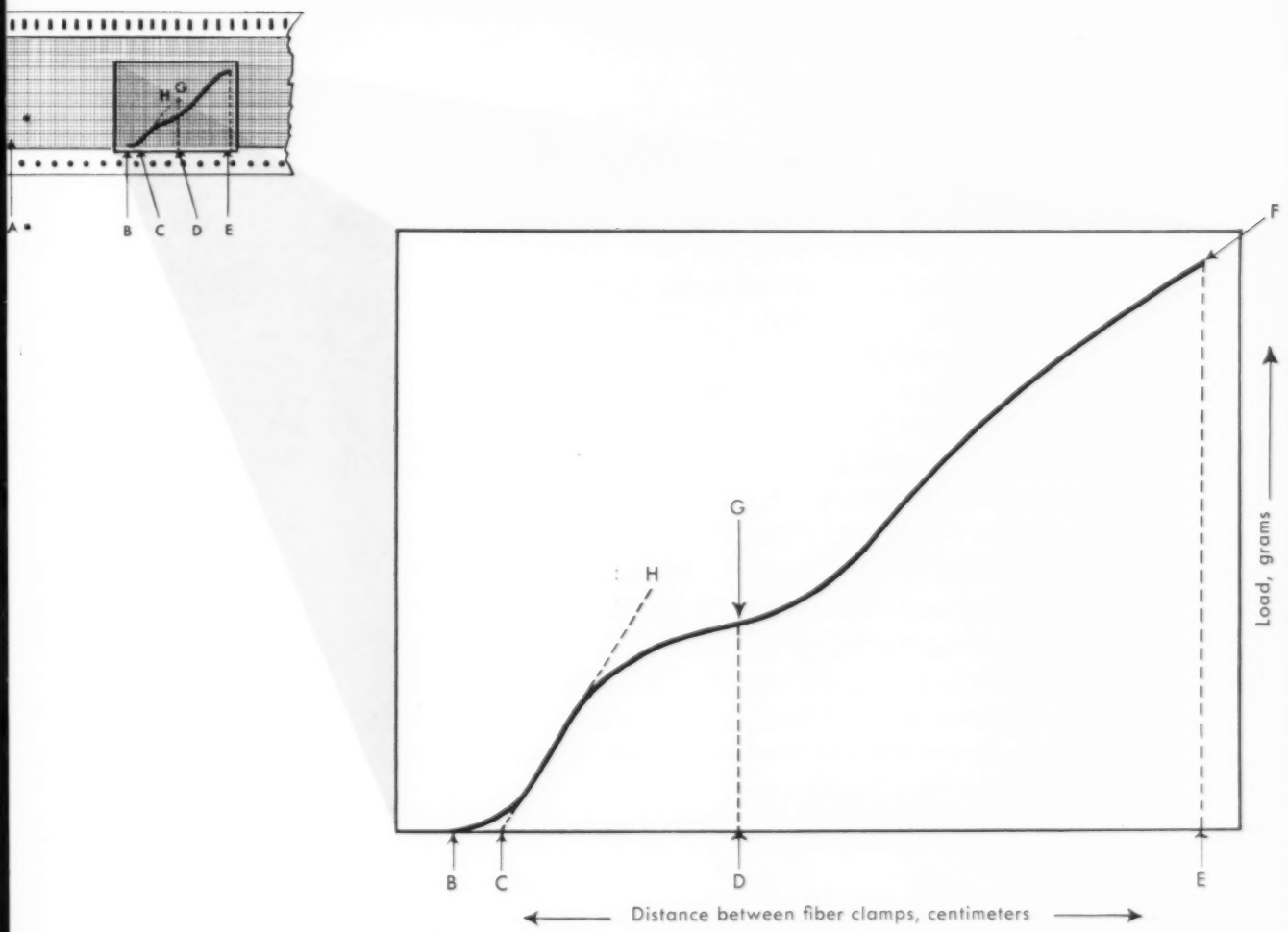
Not all the data obtained from this phase of the fiber-characterization program are reported in this article. Tests were also made to determine the effect of rate of elongation and fiber test length on stress-strain results.

Generally, fiber breaking tenacities increased as the rate of elongation increased, but the amount of increase was not considered significant over the test range.

Fiber test length had only a minor effect on breaking tenacities, but the shorter test lengths (0.5 in.) gave considerably higher values for breaking elongation and work to break and lower values for stretch resistance.

Data from these tests and more detailed information on all of the methods of testing are reported in Du Pont's Technical Information Bulletin X-82, "Some Tensile Stress-Strain Properties of Fibers."

[Test results for chemical resistance and heat resistance were reported in "How 8 Fibers Compare in Chemical Resistance," TEXTILE WORLD, March, '56, p. 112; and in "How 8 Fibers Compare in Heat Resistance," TEXTILE WORLD, Sept., '56, p. 68.]




## STRESS STRAIN CURVE FROM AN INSTRON TENSILE TESTER CHART

| | | |
|---|---|---|
| Point A | = | Point of zero distance between Instron fiber clamps |
| Line AB | = | Length of "crimped" fiber |
| Line AC | = | Test length of straightened fiber at estimated zero elongation |
| Line CD | = | Any specified elongation of fiber |
| Line CE | = | Elongation at breaking point |
| Line CH | = | Line along the "straight line" portion of the stress-strain curve BGF |
| Line DG | = | Load required to elongate by the amount CD |
| Point F | = | Breaking point of fiber |
| Line EF | = | Breaking load |

Breaking Tenacity, grams/denier $= \dfrac{EF}{\text{denier at length } AC}$

Breaking Elongation, percent $= \dfrac{CE \times 100}{AC}$

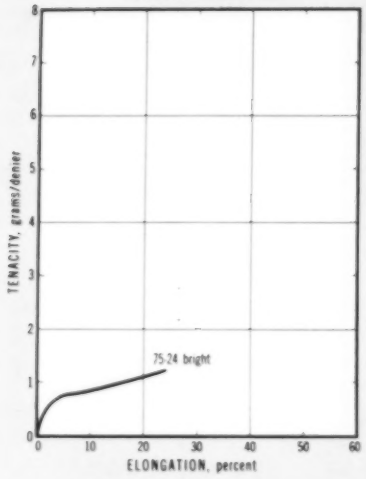
Work-to-Break, gm.cm./den.cm. $= \dfrac{\text{area under curve } CGF}{\text{denier at length } AC \times AC}$

Tenacity at any Specific Elongation, grams/denier $= \dfrac{DG}{\text{denier at length } AC}$

## stress-strain properties of boiled-off fibers

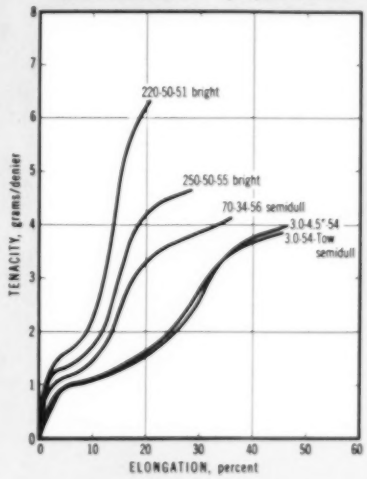
*In air at 70°F. and 65% relative humidity*

### ACETATE



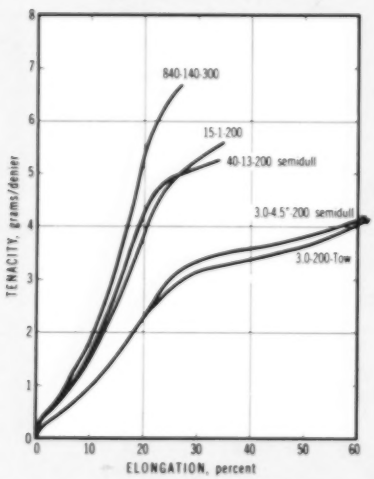

| Acetate Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 75-24 | 3.25 | 1.23 | 0.15 | 24.3 | 5.3 | 0.22 | 0.34 | 0.67 | 0.75 | 0.86 |

### "DACRON" polyester fiber



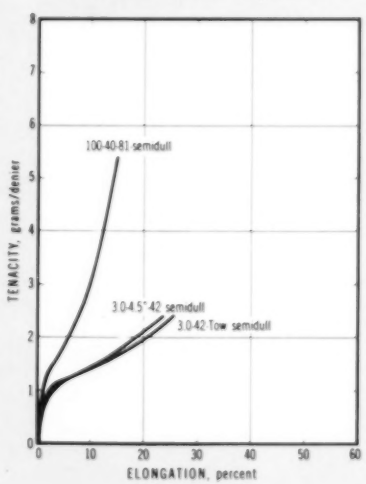

| "Dacron" Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 220-50-51 | 4.69 | 6.30 | 0.46 | 20.6 | 1.2 | 0.62 | 0.90 | 1.40 | 1.54 | 2.24 |
| 70-34-56 | 2.31 | 4.14 | 0.20 | 35.9 | 5.2 | 0.97 | 0.61 | 1.08 | 1.17 | 1.43 |
| 250-50-55 | 5.40 | 4.66 | 0.26 | 28.3 | 1.9 | 0.76 | 0.65 | 1.30 | 1.35 | 1.76 |
| 3.0-54-Tow | 3.27 | 3.84 | 0.32 | 45.3 | 6.5 | 1.03 | 0.43 | 0.84 | 0.98 | 1.13 |
| 3.0-4.5"-54 | 3.29 | 3.99 | 0.58 | 46.2 | 7.4 | 1.03 | 0.27 | 0.70 | 0.91 | 1.09 |

### NYLON (66)




| Nylon Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 840-140-300 | 6.41 | 6.66 | 0.63 | 27.1 | 1.6 | 0.93 | 0.37 | 0.62 | 0.89 | 1.84 |
| 15-1-200 | 15.83 | 5.58 | 0.36 | 34.8 | 3.0 | 1.07 | 0.35 | 0.57 | 0.76 | 1.58 |
| 40-13-200 | 3.20 | 5.25 | 0.27 | 34.1 | 2.5 | 1.10 | 0.31 | 0.56 | 0.81 | 1.62 |
| 3.0-200-Tow | 3.31 | 4.09 | 0.30 | 61.3 | 8.8 | 1.62 | 0.17 | 0.36 | 0.48 | 0.92 |
| 3.0-4.5"-200 | 3.38 | 4.20 | 0.66 | 61.3 | 13.6 | 1.74 | 0.16 | 0.38 | 0.53 | 0.98 |

### "ORLON" acrylic fiber

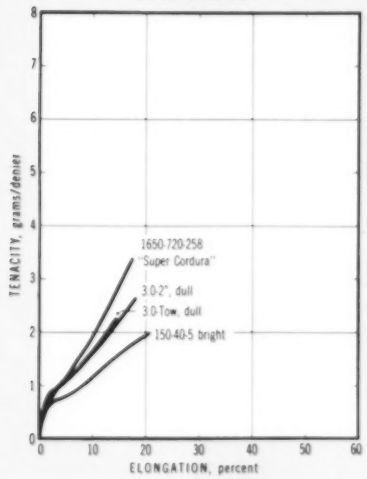



| "Orlon" Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 100-40-81 | 2.58 | 5.66 | 0.97 | 16.1 | 3.0 | 0.45 | 0.95 | 1.56 | 1.92 | 3.18 |
| 3.0-42-Tow | 3.20 | 2.40 | 0.37 | 25.7 | 3.6 | 0.41 | 0.49 | 1.08 | 1.17 | 1.41 |
| 3.0-4.5"-42 | 3.20 | 2.40 | 0.33 | 23.7 | 4.7 | 0.37 | 0.52 | 1.00 | 1.14 | 1.42 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester.*** The ***test lengths*** were 10" for all filament and tow samples, 3" for all staples except cotton which was 0.5". The ***rate of elongation*** was 50% to 67% per minute for all fibers except cotton which was 10% per minute. Each value shown is an average of ***25 determinations. S.D.*** is the standard deviation.

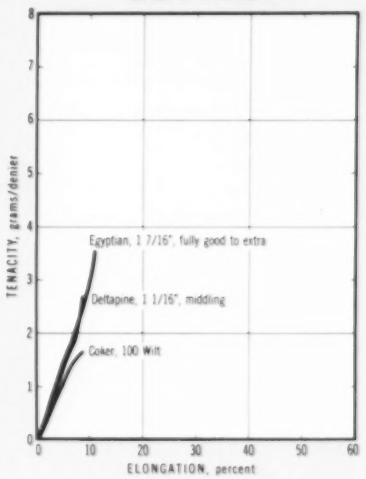
## *In air at 70°F. and 65% relative humidity, continued*

### RAYON



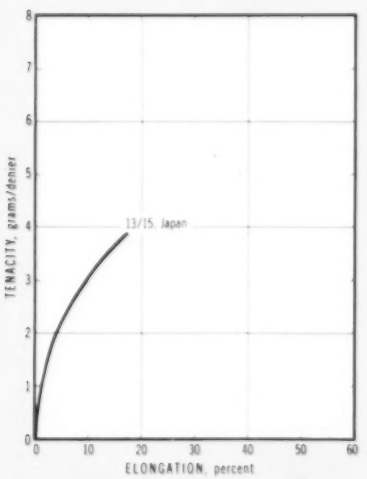

| Rayon Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 1650-720-258 | 2.54 | 3.38 | 0.40 | 17.4 | 1.4 | 0.30 | 0.71 | 0.94 | 1.16 | 1.85 |
| 3.0-Tow | 3.16 | 2.27 | 0.30 | 14.4 | 2.8 | 0.20 | 0.63 | 0.90 | 1.09 | 1.64 |
| 150-40-5 | 3.86 | 1.97 | 0.10 | 20.6 | 2.2 | 0.25 | 0.55 | 0.72 | 0.81 | 1.17 |
| 3.0-2" | 3.13 | 2.66 | 0.22 | 18.1 | 2.9 | 0.30 | 0.52 | 0.94 | 1.15 | 1.65 |

### COTTON



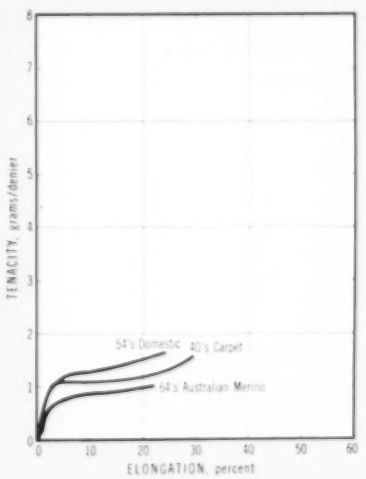

| Cotton Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| Egyptian, 1 7/16" | 1.26 | 3.55 | 1.80 | 10.9 | 5.4 | 0.18 | 0.32 | 0.91 | 1.48 | 2.94 |
| Deltapine, 1 1/16" | <1.81 | 2.68 | 1.06 | 8.6 | 2.9 | 0.11 | 0.34 | 0.81 | 1.40 | — |
| Coker, 100 Wilt | 1.58 | 1.66 | 0.63 | 8.6 | 2.6 | 0.06 | 0.29 | 0.64 | 1.04 | — |

### SILK




| Silk Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 13/15, Japan | 1.23 | 3.85 | 0.54 | 17.4 | 2.3 | 0.44 | 0.91 | 1.67 | 2.19 | 3.02 |

### WOOL



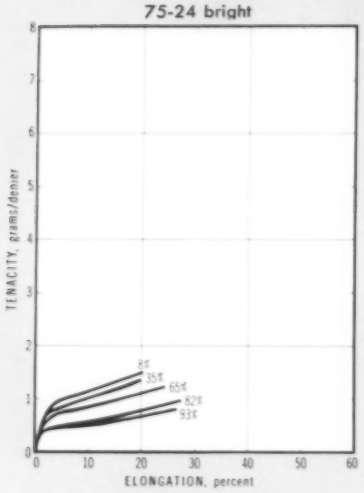

| Wool Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| Carpet | 16.84 | 1.55 | 0.39 | 29.4 | 12.0 | 0.36 | 0.44 | 1.04 | 1.07 | 1.12 |
| Aus. Merino | 4.39 | 1.02 | 0.20 | 22.0 | 10.7 | 0.18 | 0.19 | 0.66 | 0.75 | 0.87 |
| Domestic | 6.34 | 1.63 | 0.60 | 23.8 | 9.9 | 0.30 | 0.23 | 1.06 | 1.17 | 1.36 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester.*** The ***test lengths*** were 10" for all filament and tow samples, 3" for all staples except cotton which was 0.5". The ***rate of elongation*** was 50% to 67% per minute for all fibers except cotton which was 10% per minute. Each value shown is an average of ***25 determinations. S.D.*** is the standard deviation.

## stress-strain properties of boiled-off fibers

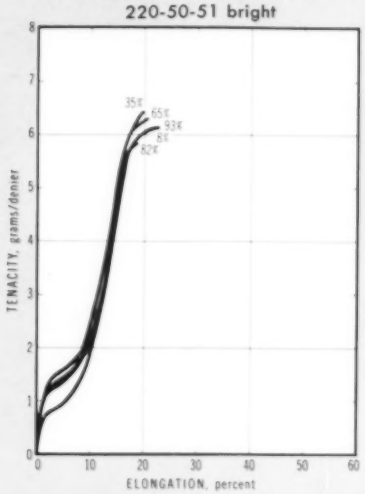
*In air at 70°F. and various relative humidities*

### ACETATE
75-24 bright



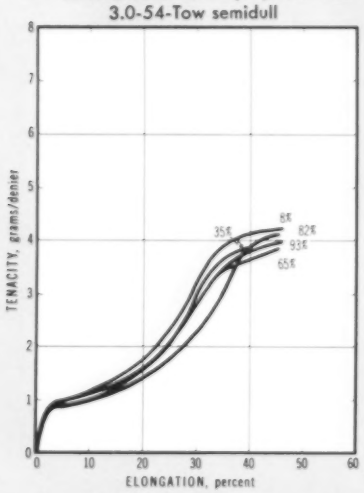

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 3.26 | 1.48 | 0.20 | 20.3 | 5.7 | 0.22 | 0.46 | 0.84 | 0.97 | 1.13 |
| 35 | 3.19 | 1.36 | 0.17 | 19.8 | 4.5 | 0.20 | 0.42 | 0.75 | 0.85 | 1.03 |
| 65 | 3.23 | 1.23 | 0.15 | 24.3 | 5.3 | 0.22 | 0.34 | 0.67 | 0.75 | 0.86 |
| 82 | 3.20 | 0.98 | 0.10 | 27.3 | 3.1 | 0.18 | 0.28 | 0.45 | 0.52 | 0.59 |
| 93 | 3.22 | 0.81 | 0.10 | 26.4 | 6.8 | 0.16 | 0.26 | 0.45 | 0.47 | 0.54 |

### "DACRON" polyester fiber
220-50-51 bright



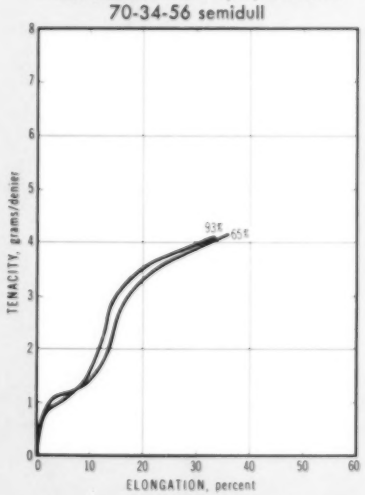

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 4.75 | 6.10 | 0.49 | 21.0 | 2.3 | 0.65 | 0.84 | 1.33 | 1.43 | 2.10 |
| 35 | 4.78 | 6.43 | 0.49 | 19.7 | 0.6 | 0.59 | 0.88 | 1.30 | 1.44 | 2.66 |
| 65 | 4.69 | 6.30 | 0.46 | 20.6 | 1.2 | 0.62 | 0.90 | 1.40 | 1.54 | 2.24 |
| 82 | 4.81 | 5.83 | 0.95 | 18.3 | 2.5 | 0.47 | 0.62 | 0.83 | 0.96 | 1.98 |
| 93 | 4.70 | 6.11 | 0.41 | 22.7 | 5.2 | 0.61 | 0.81 | 1.23 | 1.34 | 2.19 |

### "DACRON" polyester fiber
3.0-54-Tow semidull




| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 3.10 | 4.20 | 0.47 | 46.2 | 4.8 | 1.15 | 0.42 | 0.90 | 1.00 | 1.16 |
| 35 | 3.23 | 3.69 | 0.63 | 38.0 | 4.5 | 0.70 | 0.37 | 0.84 | 0.99 | 1.14 |
| 65 | 3.27 | 3.84 | 0.32 | 45.3 | 6.5 | 1.03 | 0.43 | 0.84 | 0.98 | 1.13 |
| 82 | 3.23 | 4.11 | 0.48 | 45.4 | 6.5 | 1.13 | 0.43 | 0.77 | 0.87 | 0.99 |
| 93 | 3.23 | 3.96 | 0.37 | 46.8 | 5.9 | 1.08 | 0.43 | 0.77 | 0.90 | 1.02 |

### "DACRON" polyester fiber
70-34-56 semidull

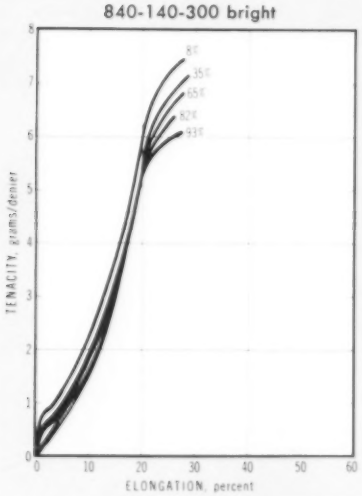



| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 65 | 2.31 | 4.14 | 0.20 | 35.9 | 5.2 | 0.97 | 0.61 | 1.08 | 1.17 | 1.43 |
| 93 | 2.42 | 4.10 | 0.17 | 33.5 | 5.3 | 0.90 | 0.74 | 0.99 | 1.07 | 1.57 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester.*** The ***test lengths*** were 10″ for all filament and tow samples, 3″ for all staples except cotton which was 0.5″. The ***rate of elongation*** was 50% to 67% per minute for all fibers except cotton which was 10% per minute. Each value shown is an average of ***25 determinations. S.D.*** is the standard deviation.

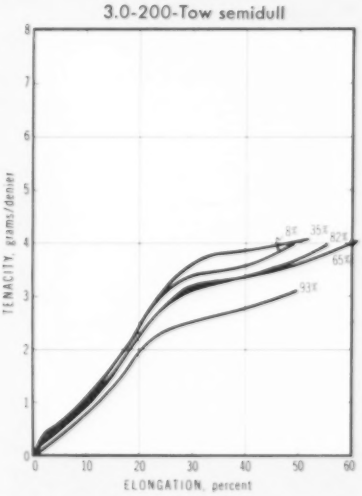
## *In air at 70°F. and various relative humidities, continued*

**NYLON** (66)
840-140-300 bright



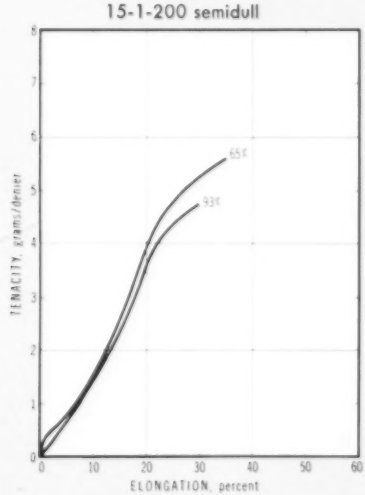

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 6.46 | 7.43 | 0.48 | 27.6 | 2.5 | 1.00 | 0.70 | 0.94 | 1.24 | 2.29 |
| 35 | 6.58 | 7.14 | 0.41 | 28.7 | 2.1 | 1.04 | 0.42 | 0.73 | 0.99 | 1.90 |
| 65 | 6.41 | 6.66 | 0.63 | 27.1 | 1.6 | 0.93 | 0.37 | 0.62 | 0.89 | 1.84 |
| 82 | 6.43 | 6.38 | 0.68 | 26.2 | 3.3 | 0.82 | 0.16 | 0.47 | 0.75 | 1.66 |
| 93 | 6.65 | 6.08 | 0.37 | 27.1 | 3.2 | 0.80 | 0.15 | 0.38 | 0.65 | 1.50 |

**NYLON** (66)
3.0-200-Tow semidull



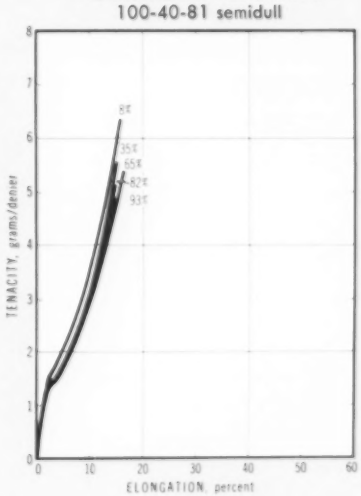

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 3.40 | 3.99 | 1.01 | 48.9 | 8.2 | 1.26 | 0.24 | 0.50 | 0.62 | 1.09 |
| 35 | 3.40 | 4.12 | 0.37 | 51.6 | 11.0 | 1.50 | 0.24 | 0.47 | 0.62 | 1.09 |
| 65 | 3.31 | 4.09 | 0.30 | 61.3 | 8.8 | 1.62 | 0.17 | 0.36 | 0.48 | 0.92 |
| 82 | 3.45 | 3.96 | 0.86 | 55.1 | 13.3 | 1.39 | 0.12 | 0.29 | 0.46 | 0.96 |
| 93 | 3.46 | 3.10 | 0.30 | 49.6 | 11.0 | 1.00 | 0.06 | 0.20 | 0.38 | 0.78 |

**NYLON** (66)
15-1-200 semidull




| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 65 | 15.83 | 5.58 | 0.36 | 34.8 | 3.0 | 1.07 | 0.35 | 0.57 | 0.76 | 1.58 |
| 93 | 15.52 | 4.73 | 0.20 | 29.7 | 3.5 | 0.71 | 0.16 | 0.39 | 0.64 | 1.42 |

**"ORLON"** acrylic fiber
100-40-81 semidull

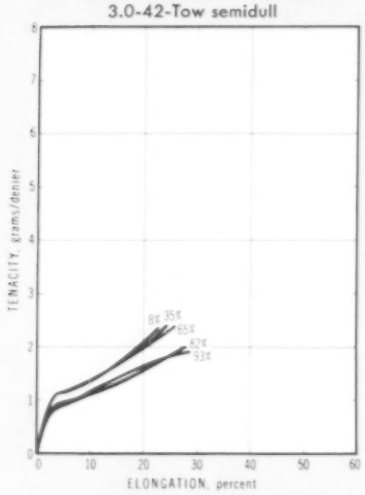



| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 2.56 | 6.33 | 0.88 | 15.8 | 3.3 | 0.50 | 1.02 | 1.64 | 2.03 | 3.55 |
| 35 | 2.55 | 5.56 | 0.95 | 15.1 | 1.9 | 0.41 | 0.94 | 1.41 | 1.76 | 3.25 |
| 65 | 2.58 | 5.39 | 0.94 | 16.1 | 3.1 | 0.42 | 0.88 | 1.48 | 1.82 | 3.02 |
| 82 | 2.59 | 5.14 | 1.28 | 14.7 | 2.1 | 0.38 | 0.94 | 1.46 | 1.77 | 3.15 |
| 93 | 2.54 | 4.89 | 1.20 | 14.7 | 2.8 | 0.37 | 0.90 | 1.39 | 1.68 | 3.00 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester.*** The ***test lengths*** were 10″ for all filament and tow samples, 3″ for all staples except cotton which was 0.5″. The ***rate of elongation*** was 50% to 67% per minute for all fibers except cotton which was 10% per minute. Each value shown is an average of ***25 determinations. S.D.*** is the standard deviation.

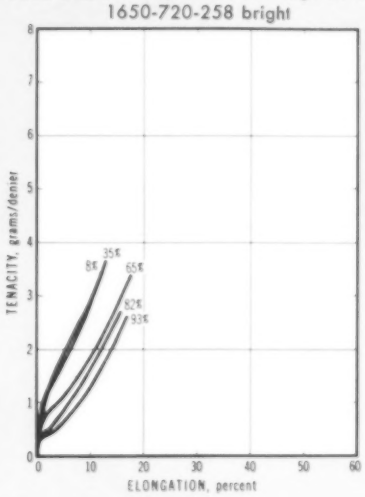
## *In air at 70°F. and various relative humidities, continued*

**"ORLON"** acrylic fiber
3.0-42-Tow semidull



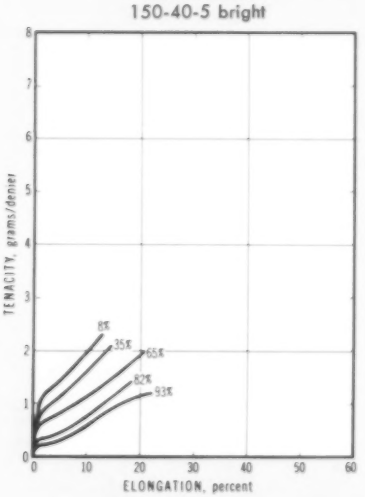

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 3.16 | 2.37 | 0.24 | 22.8 | 2.3 | 0.34 | 0.51 | 1.03 | 1.14 | 1.39 |
| 35 | 3.12 | 2.42 | 0.23 | 24.4 | 3.0 | 0.38 | 0.48 | 1.05 | 1.15 | 1.40 |
| 65 | 3.20 | 2.40 | 0.37 | 25.7 | 3.6 | 0.41 | 0.49 | 1.08 | 1.17 | 1.41 |
| 82 | 3.10 | 1.98 | 0.33 | 27.8 | 3.0 | 0.38 | 0.48 | 0.87 | 0.94 | 1.11 |
| 93 | 3.17 | 1.91 | 0.18 | 28.4 | 2.9 | 0.35 | 0.38 | 0.85 | 0.93 | 1.17 |

**RAYON** "Super Cordura" high tenacity
1650-720-258 bright



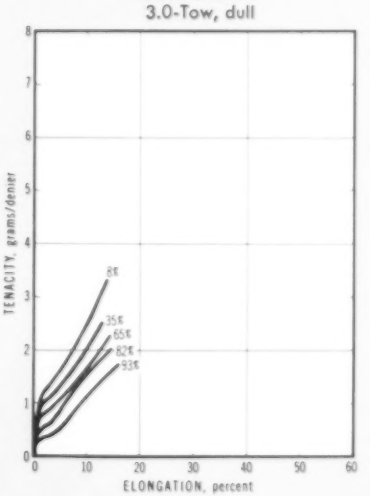

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 2.65 | 3.45 | 0.49 | 11.8 | 2.9 | 0.24 | 1.02 | 1.51 | 1.96 | 3.02 |
| 35 | 2.40 | 3.66 | 1.00 | 12.7 | 3.2 | 0.27 | 1.00 | 1.38 | 1.75 | 2.83 |
| 65 | 2.54 | 3.38 | 0.40 | 17.4 | 1.4 | 0.30 | 0.71 | 0.94 | 1.16 | 1.85 |
| 82 | 2.58 | 2.72 | 0.45 | 15.5 | 2.8 | 0.20 | 0.43 | 0.62 | 0.85 | 1.59 |
| 93 | 2.59 | 2.62 | 0.25 | 16.6 | 2.2 | 0.20 | 0.35 | 0.46 | 0.66 | 1.31 |

**RAYON**
150-40-5 bright




| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 3.92 | 2.31 | 0.26 | 12.7 | 3.2 | 0.20 | 0.94 | 1.28 | 1.48 | 1.99 |
| 35 | 3.93 | 2.10 | 0.29 | 14.5 | 3.7 | 0.20 | 0.71 | 0.99 | 1.16 | 1.62 |
| 65 | 3.86 | 1.97 | 0.10 | 20.6 | 2.2 | 0.25 | 0.55 | 0.72 | 0.81 | 1.17 |
| 82 | 3.85 | 1.42 | 0.20 | 18.2 | 2.8 | 0.14 | 0.34 | 0.38 | 0.45 | 0.78 |
| 93 | 3.89 | 1.21 | 0.14 | 22.1 | 2.6 | 0.15 | 0.20 | 0.24 | 0.31 | 0.60 |

**RAYON**
3.0-Tow, dull

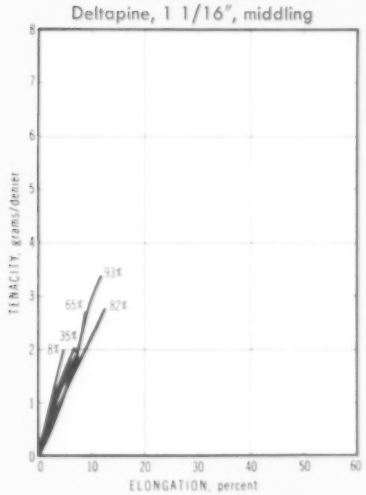



| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 3.12 | 3.32 | 0.37 | 13.8 | 2.8 | 0.26 | 0.90 | 1.35 | 1.60 | 2.50 |
| 35 | 3.17 | 2.53 | 0.14 | 12.8 | 2.0 | 0.21 | 0.77 | 1.12 | 1.36 | 2.03 |
| 65 | 3.16 | 2.27 | 0.30 | 14.4 | 2.8 | 0.20 | 0.63 | 0.90 | 1.09 | 1.64 |
| 82 | 3.16 | 2.01 | 0.29 | 14.6 | 2.1 | 0.15 | 0.44 | 0.60 | 0.85 | 1.52 |
| 93 | 3.16 | 1.73 | 0.20 | 15.8 | 2.6 | 0.13 | 0.28 | 0.38 | 0.55 | 1.12 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester.*** The ***test lengths*** were 10" for all filament and tow samples, 3" for all staples except cotton which was 0.5". The ***rate of elongation*** was 50% to 67% per minute for all fibers except cotton which was 10% per minute. Each value shown is an average of ***25 determinations. S.D.*** is the standard deviation.

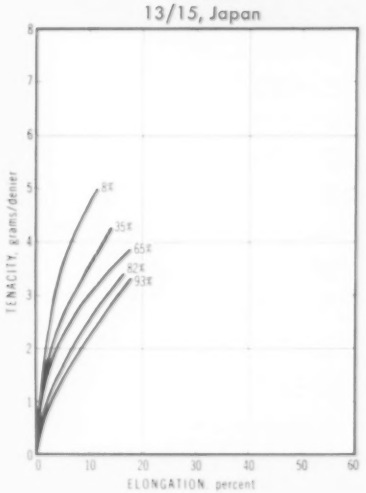
## *In air at 70°F. and various relative humidities, continued*

### COTTON
Deltapine, 1 1/16", middling



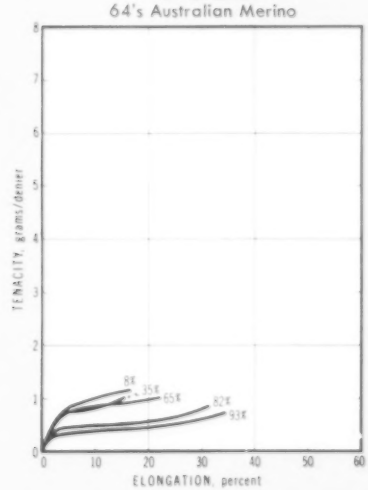

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 1.81 | 1.98 | 0.68 | 4.9 | 2.1 | 0.06 | 0.43 | 1.25 | — | — |
| 35 | 1.81 | 2.03 | 0.92 | 6.7 | 2.2 | 0.07 | 0.39 | 1.01 | 1.58 | — |
| 65 | 1.81 | 2.68 | 1.06 | 8.6 | 2.9 | 0.11 | 0.34 | 0.81 | 1.40 | — |
| 82 | 1.81 | 2.77 | 1.07 | 12.5 | 5.8 | 0.15 | 0.29 | 0.72 | 1.16 | 2.23 |
| 93 | 1.81 | 3.38 | 1.13 | 10.8 | 2.8 | 0.15 | 0.19 | 0.66 | 1.18 | 2.93 |

### SILK
13/15, Japan



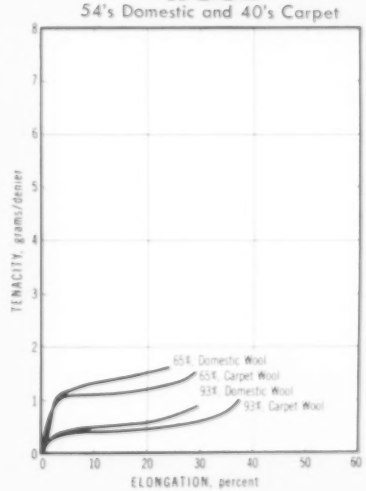

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 1.15 | 4.97 | 1.09 | 11.5 | 3.0 | 0.39 | 1.13 | 2.70 | 3.48 | 4.70 |
| 35 | 1.28 | 4.27 | 1.05 | 14.0 | 3.2 | 0.37 | 1.09 | 2.03 | 2.54 | 3.52 |
| 65 | 1.23 | 3.85 | 0.54 | 17.4 | 2.3 | 0.44 | 0.91 | 1.67 | 2.19 | 3.02 |
| 82 | 1.08 | 3.38 | 0.59 | 16.5 | 4.0 | 0.35 | 0.65 | 1.16 | 1.57 | 2.55 |
| 93 | 1.07 | 3.30 | 0.93 | 17.9 | 1.6 | 0.34 | 0.47 | 0.96 | 1.38 | 2.20 |

### WOOL
64's Australian Merino




| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 | 5.87 | 1.16 | 0.30 | 16.4 | 6.5 | 0.13 | 0.39 | 0.63 | 0.82 | 1.00 |
| 35 | 7.65 | 1.04 | 0.57 | 15.4 | 7.9 | 0.12 | 0.24 | 0.57 | 0.74 | 0.87 |
| 65 | 4.39 | 1.02 | 0.20 | 22.0 | 10.7 | 0.18 | 0.19 | 0.66 | 0.75 | 0.87 |
| 82 | 5.61 | 0.87 | 0.40 | 31.4 | 8.7 | 0.20 | 0.22 | 0.41 | 0.44 | 0.46 |
| 93 | 4.22 | 0.73 | 0.33 | 34.4 | 9.9 | 0.18 | 0.13 | 0.28 | 0.31 | 0.38 |

### WOOL
54's Domestic and 40's Carpet



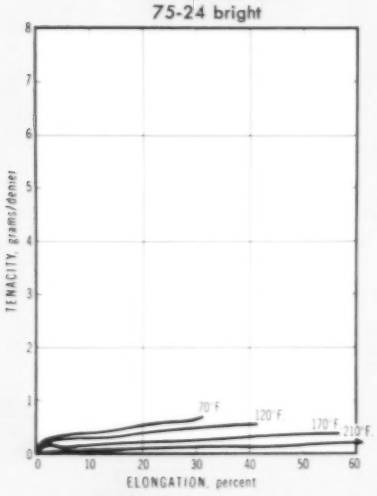

| R.H. During Test % | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| Domestic Wool | | | | | | | | | | |
| 65 | 6.34 | 1.63 | 0.60 | 23.8 | 9.9 | 0.30 | 0.23 | 1.06 | 1.17 | 1.36 |
| 93 | 7.95 | 0.91 | 0.39 | 29.7 | 7.7 | 0.15 | 0.18 | 0.36 | 0.44 | 0.49 |
| Carpet Wool | | | | | | | | | | |
| 65 | 16.84 | 1.55 | 0.39 | 29.4 | 12.0 | 0.36 | 0.44 | 1.04 | 1.07 | 1.12 |
| 93 | 20.62 | 1.04 | 0.46 | 37.3 | 8.9 | 0.19 | 0.24 | 0.33 | 0.35 | 0.38 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester.*** The ***test lengths*** were 10" for all filament and tow samples, 3" for all staples except cotton which was 0.5". The ***rate of elongation*** was 50% to 67% per minute for all fibers except cotton which was 10% per minute. Each value shown is an average of ***25 determinations.*** ***S.D.*** is the standard deviation.

## stress-strain properties of boiled-off fibers

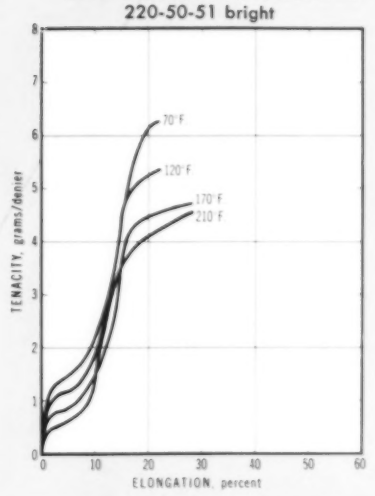
*In water at various temperatures*

### ACETATE
75-24 bright



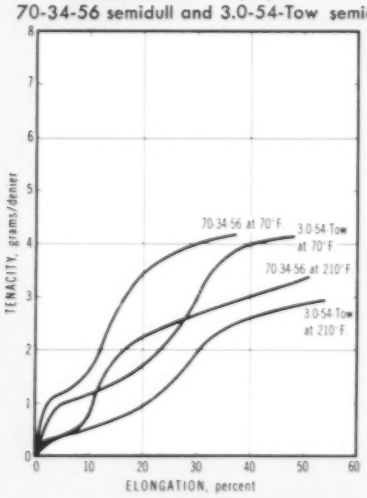

| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 3.22 | 0.70 | 0.14 | 31.2 | 6.6 | 0.14 | 0.19 | 0.29 | 0.34 | 0.40 |
| 120 | 3.26 | 0.56 | 0.10 | 41.5 | 6.0 | 0.15 | 0.14 | 0.23 | 0.26 | 0.28 |
| 170 | 3.28 | 0.36 | 0.05 | 56.8 | 5.7 | 0.14 | 0.10 | 0.15 | 0.13 | 0.15 |
| 210 | 3.28 | 0.23 | 0.10 | 75.2 | 9.5 | 0.09 | 0.02 | 0.03 | 0.04 | 0.05 |

### "DACRON" polyester fiber
220-50-51 bright



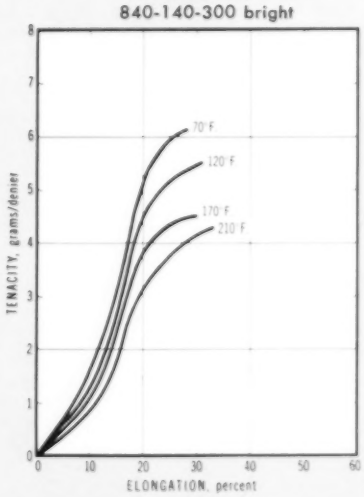

| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 4.78 | 6.25 | 0.57 | 22.1 | 1.3 | 0.69 | 0.90 | 1.34 | 1.48 | 2.20 |
| 120 | 4.71 | 5.33 | 0.27 | 22.3 | 2.6 | 0.61 | 0.74 | 1.08 | 1.19 | 1.89 |
| 170 | 4.70 | 4.73 | 0.41 | 28.1 | 5.7 | 0.76 | 0.53 | 0.79 | 0.85 | 1.49 |
| 210 | 4.72 | 4.55 | 0.69 | 28.5 | 6.7 | 0.75 | 0.34 | 0.51 | 0.61 | 1.31 |

### "DACRON" polyester fiber
70-34-56 semidull and 3.0-54-Tow semidull




| Fiber—Water Temperature | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70-34-56 | | | | | | | | | | |
| 70° F. | 2.40 | 4.16 | 0.42 | 37.1 | 6.5 | 1.01 | 0.67 | 1.08 | 1.19 | 1.62 |
| 210° F. | 2.41 | 3.39 | 0.44 | 51.1 | 6.1 | 1.06 | 0.12 | 0.31 | 0.37 | 0.77 |
| 3.0-54-Tow | | | | | | | | | | |
| 70° F. | 3.08 | 4.12 | 0.36 | 48.1 | 11.3 | 1.25 | 0.28 | 0.75 | 0.97 | 1.17 |
| 210° F. | 3.27 | 2.94 | 0.33 | 53.9 | 9.8 | 0.87 | 0.08 | 0.24 | 0.33 | 0.50 |

### NYLON (66)
840-140-300 bright

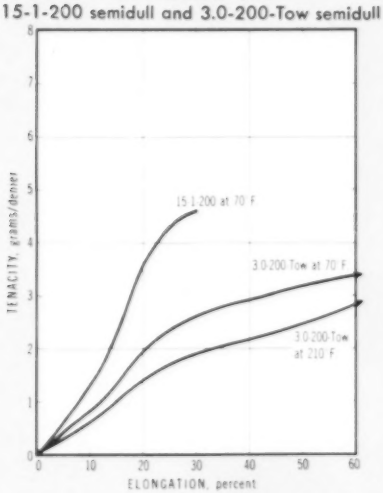



| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 6.52 | 6.13 | 0.57 | 28.4 | 2.1 | 0.83 | 0.15 | 0.41 | 0.67 | 1.58 |
| 120 | 6.52 | 5.51 | 0.42 | 31.2 | 2.5 | 0.89 | 0.12 | 0.31 | 0.58 | 1.27 |
| 170 | 6.60 | 4.48 | 0.23 | 30.3 | 4.7 | 0.70 | 0.11 | 0.29 | 0.48 | 1.06 |
| 210 | 6.52 | 4.26 | 0.41 | 33.2 | 4.7 | 0.73 | 0.06 | 0.18 | 0.35 | 0.84 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester***. The ***test lengths*** were 2″ to 3″ for the wools, 0.5″ for the cottons, and 5″ for all filament and tow samples except "Orlon" tow which was tested at 170°F. and 210°F., for which the test length was 3″. The ***rate of elongation*** was 60% per minute for all fibers except cotton, which was 10% per minute. Each value shown is an average of ***25 determinations***. ***S.D.*** is the standard deviation.

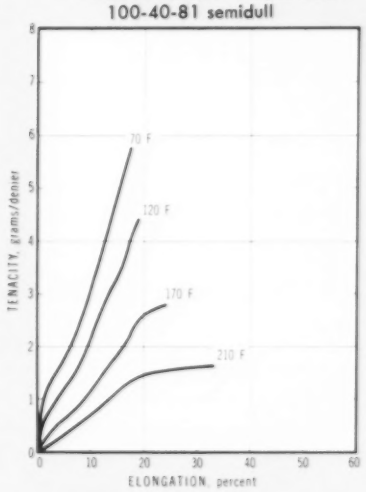
## *In water at various temperatures , continued*

**NYLON** (66)
15-1-200 semidull and 3.0-200-Tow semidull



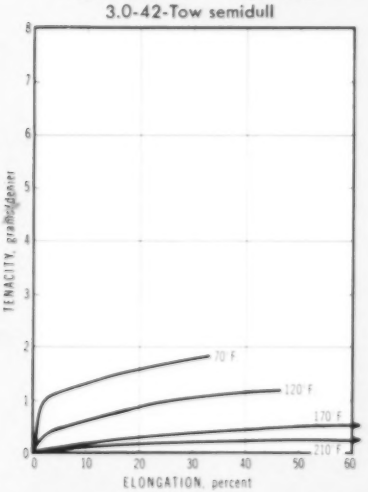

| Fiber—Water Temperature | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 15-1-200 70° F. | 15.50 | 4.63 | 0.26 | 32.4 | 2.6 | 0.82 | 0.19 | 0.44 | 0.68 | 1.42 |
| 3.0-200-Tow 70° F. | 3.41 | 3.50 | 0.50 | 63.0 | 11.5 | 1.33 | 0.08 | 0.25 | 0.41 | 0.84 |
| 210° F. | 3.22 | 2.97 | 0.32 | 68.1 | 7.8 | 1.28 | 0.05 | 0.17 | 0.31 | 0.60 |

**"ORLON"** acrylic fiber
100-40-81 semidull



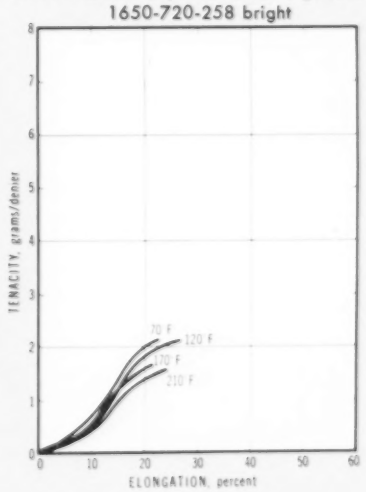

| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 2.60 | 5.76 | 0.66 | 17.5 | 1.2 | 0.50 | 0.89 | 1.43 | 1.78 | 3.09 |
| 120 | 2.55 | 4.37 | 0.45 | 19.2 | 1.5 | 0.42 | 0.54 | 0.86 | 1.19 | 2.16 |
| 170 | 2.57 | 2.79 | 0.30 | 24.4 | 2.8 | 0.36 | 0.18 | 0.41 | 0.60 | 1.14 |
| 210 | 2.56 | 1.62 | 0.18 | 33.6 | 5.1 | 0.35 | 0.06 | 0.19 | 0.31 | 0.66 |

**"ORLON"** acrylic fiber
3.0-42-Tow semidull




| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 3.15 | 1.82 | 0.10 | 33.0 | 4.7 | 0.58 | 0.47 | 1.06 | 1.17 | 1.31 |
| 120 | 3.28 | 1.19 | 0.10 | 46.4 | 3.7 | 0.39 | 0.21 | 0.38 | 0.45 | 0.62 |
| 170 | 3.26 | 0.82 | 0.05 | 98.7 | 14.0 | 0.47 | 0.03 | 0.08 | 0.11 | 0.18 |
| 210 | 3.18 | 0.62 | 0.15 | 158.0 | 31.8 | 0.28 | 0.01 | 0.03 | 0.05 | 0.09 |

**RAYON** "Super Cordura" high tenacity
1650-720-258 bright

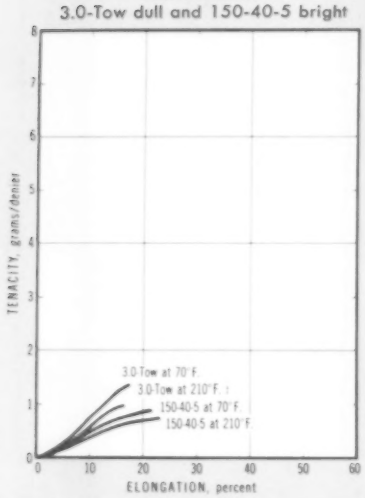



| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 2.66 | 2.13 | 0.30 | 22.7 | 2.7 | 0.21 | 0.04 | 0.13 | 0.26 | 0.71 |
| 120 | 2.61 | 2.10 | 0.15 | 26.6 | 3.7 | 0.26 | 0.03 | 0.10 | 0.18 | 0.53 |
| 170 | 2.65 | 1.65 | 0.20 | 21.5 | 2.9 | 0.16 | 0.04 | 0.11 | 0.22 | 0.56 |
| 210 | 2.65 | 1.56 | 0.30 | 24.1 | 4.1 | 0.17 | 0.03 | 0.09 | 0.16 | 0.44 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester.*** The ***test lengths*** were 2″ to 3″ for the wools, 0.5″ for the cottons, and 5″ for all filament and tow samples except "Orlon" tow which was tested at 170°F. and 210°F., for which the test length was 3″. The ***rate of elongation*** was 60% per minute for all fibers except cotton, which was 10% per minute. Each value shown is an average of ***25 determinations. S.D.*** is the standard deviation.

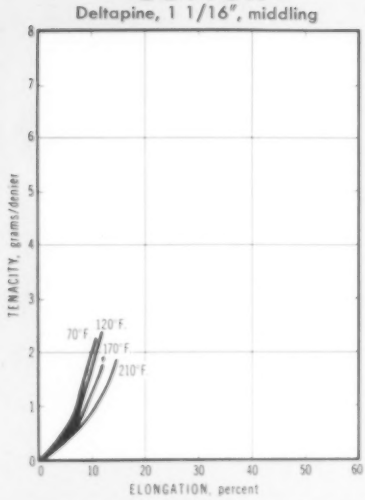
## *In water at various temperatures, continued*

### RAYON
3.0-Tow dull and 150-40-5 bright



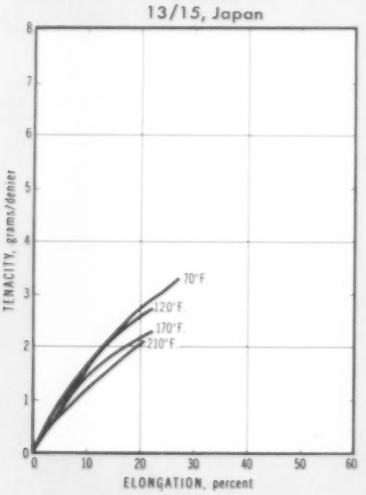

| Fiber—Water Temperature | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 3.0-Tow | | | | | | | | | | |
| 70° F. | 3.16 | 1.33 | 0.22 | 17.5 | 2.7 | 0.11 | 0.04 | 0.14 | 0.28 | 0.72 |
| 210° F. | 3.18 | 0.97 | 0.20 | 16.5 | 3.1 | 0.08 | 0.04 | 0.12 | 0.22 | 0.55 |
| 150-40-5 | | | | | | | | | | |
| 70° F. | 3.87 | 0.86 | 0.06 | 21.8 | 2.4 | 0.10 | 0.04 | 0.11 | 0.20 | 0.48 |
| 210° F. | 3.88 | 0.71 | 0.10 | 23.2 | 4.8 | 0.18 | 0.02 | 0.09 | 0.16 | 0.38 |

### COTTON
Deltapine, 1 1/16", middling



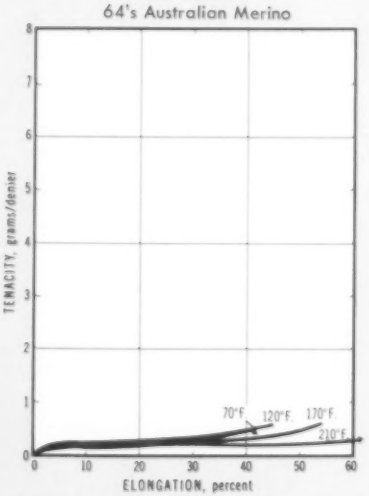

| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 1.81 | 2.27 | 1.01 | 10.8 | 2.7 | 0.14 | 0.09 | 0.32 | 0.60 | 2.03 |
| 120 | 1.81 | 2.38 | 1.15 | 11.7 | 2.2 | 0.08 | 0.08 | 0.27 | 0.46 | 1.76 |
| 170 | 1.81 | 1.77 | 0.74 | 11.9 | 3.0 | 0.08 | 0.08 | 0.25 | 0.43 | 1.24 |
| 210 | 1.81 | 1.86 | 0.66 | 14.6 | 4.4 | 0.08 | 0.07 | 0.20 | 0.36 | 0.91 |

### SILK
13/15, Japan




| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 1.30 | 3.30 | 0.86 | 27.1 | 3.9 | 0.52 | 0.25 | 0.64 | 1.00 | 1.64 |
| 120 | 1.02 | 2.72 | 0.63 | 22.1 | 6.5 | 0.40 | 0.18 | 0.52 | 0.84 | 1.60 |
| 170 | 1.16 | 2.26 | 0.57 | 22.2 | 6.2 | 0.31 | 0.16 | 0.51 | 0.82 | 1.43 |
| 210 | 1.12 | 2.09 | 0.54 | 20.6 | 3.8 | 0.23 | 0.19 | 0.46 | 0.69 | 1.20 |

### WOOL
64's Australian Merino



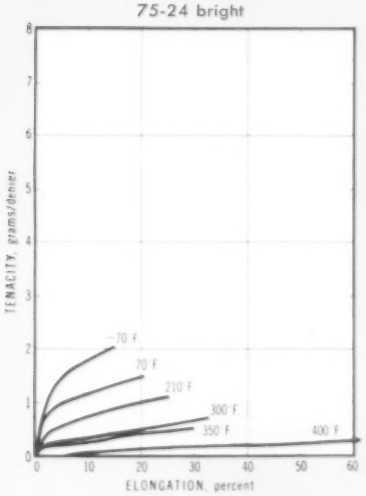

| Water Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 5.01 | 0.49 | 0.17 | 41.0 | 5.3 | 0.09 | 0.06 | 0.10 | 0.12 | 0.15 |
| 120 | 6.52 | 0.58 | 0.15 | 44.6 | 6.0 | 0.13 | 0.07 | 0.16 | 0.20 | 0.23 |
| 170 | 5.09 | 0.60 | 0.37 | 54.0 | 4.9 | 0.15 | 0.05 | 0.12 | 0.14 | 0.18 |
| 210 | 5.56 | 0.33 | 0.17 | 67.2 | 12.7 | 0.13 | 0.07 | 0.12 | 0.13 | 0.16 |

Boiled-off ***single filaments*** or fibers were tested on the ***Instron Tensile Tester***. The ***test lengths*** were 2″ to 3″ for the wools, 0.5″ for the cottons, and 5″ for all filament and tow samples except "Orlon" tow which was tested at 170°F. and 210°F., for which the test length was 3″. The ***rate of elongation*** was 60% per minute for all fibers except cotton, which was 10% per minute. Each value shown is an average of ***25 determinations. S.D.*** is the standard deviation.

## stress-strain properties of boiled-off fibers

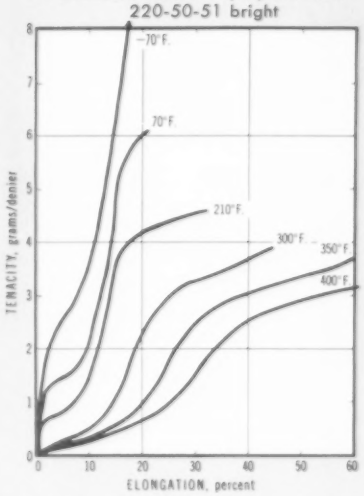
*In air at various temperatures*

### ACETATE
75-24 bright



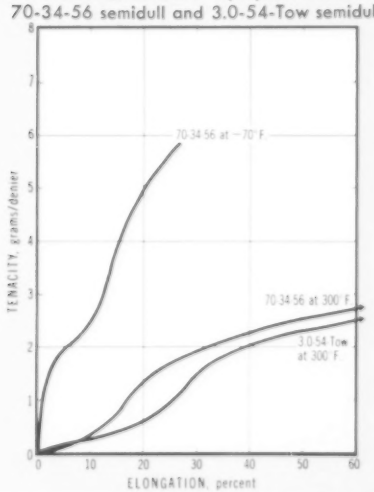

| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| —70 | 3.23 | 2.03 | 0.28 | 14.7 | 3.6 | 0.22 | 0.53 | 1.18 | 1.46 | 1.80 |
| 70 | 3.26 | 1.48 | 0.20 | 20.3 | 5.7 | 0.22 | 0.46 | 0.84 | 0.97 | 1.13 |
| 210 | 3.22 | 1.09 | 0.03 | 25.0 | 4.4 | 0.19 | 0.14 | 0.47 | 0.56 | 0.73 |
| 300 | 3.27 | 0.69 | 0.10 | 32.3 | 4.7 | 0.14 | 0.16 | 0.25 | 0.28 | 0.35 |
| 350 | 3.25 | 0.51 | 0.06 | 29.5 | 9.2 | 0.09 | 0.14 | 0.20 | 0.22 | 0.27 |
| 400 | 3.27 | 0.28 | 0.06 | 60.6 | 12.1 | 0.09 | 0.01 | 0.02 | 0.03 | 0.06 |

### "DACRON" polyester fiber
220-50-51 bright



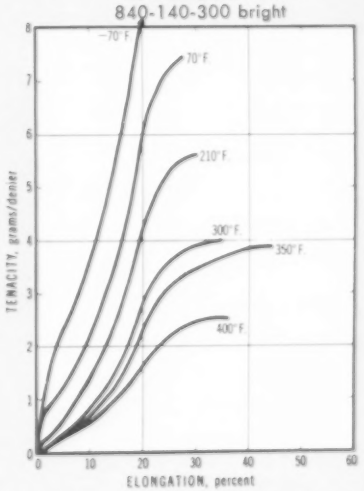

| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| —70 | 4.74 | 8.51 | 0.85 | 18.6 | 1.4 | 0.76 | 1.22 | 2.11 | 2.49 | 3.59 |
| 70 | 4.75 | 6.10 | 0.49 | 21.0 | 2.3 | 0.65 | 0.84 | 1.33 | 1.43 | 2.10 |
| 210 | 4.89 | 4.60 | 0.52 | 32.3 | 4.5 | 0.93 | 0.53 | 0.74 | 0.82 | 1.45 |
| 300 | 4.75 | 3.91 | 0.70 | 44.5 | 6.2 | 0.94 | 0.08 | 0.19 | 0.25 | 0.50 |
| 350 | 4.74 | 3.69 | 0.53 | 59.6 | 10.8 | 1.13 | 0.04 | 0.13 | 0.21 | 0.36 |
| 400 | 4.77 | 3.18 | 0.87 | 61.2 | 13.7 | 1.00 | 0.04 | 0.10 | 0.15 | 0.27 |

### "DACRON" polyester fiber
70-34-56 semidull and 3.0-54-Tow semidull




| Fiber—Air Temperature | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 70-34-56 —70° F. | 2.44 | 5.82 | 0.73 | 26.8 | 3.3 | 0.94 | 0.98 | 1.64 | 1.93 | 2.50 |
| 300° F. | 2.40 | 2.73 | 0.32 | 60.2 | 12.6 | 0.94 | 0.03 | 0.10 | 0.14 | 0.35 |
| 3.0-54-Tow 300°F. | 3.26 | 2.62 | 0.45 | 65.9 | 10.9 | 0.93 | 0.05 | 0.11 | 0.16 | 0.28 |

### NYLON (66)
840-140-300 bright

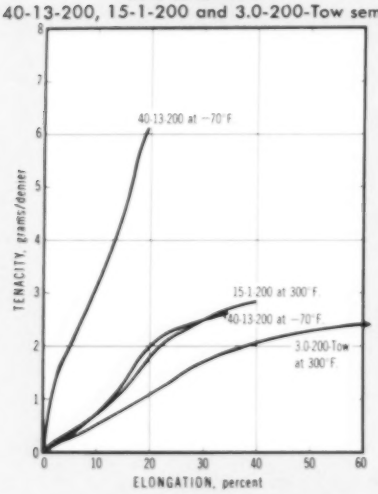



| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| —70 | 6.43 | 10.56 | 1.22 | 23.6 | 2.2 | 1.15 | 1.01 | 1.77 | 2.33 | 3.73 |
| 70 | 6.46 | 7.43 | 0.48 | 27.6 | 2.5 | 1.00 | 0.70 | 0.94 | 1.24 | 2.24 |
| 210 | 6.52 | 5.58 | 0.37 | 29.0 | 3.1 | 0.80 | 0.20 | 0.43 | 0.67 | 1.46 |
| 300 | 6.45 | 3.98 | 0.37 | 34.4 | 6.7 | 0.73 | 0.08 | 0.25 | 0.39 | 0.85 |
| 350 | 6.60 | 3.88 | 0.37 | 43.9 | 5.5 | 0.95 | 0.08 | 0.21 | 0.35 | 0.74 |
| 400 | 6.56 | 2.52 | 0.62 | 35.9 | 13.0 | 0.52 | 0.04 | 0.18 | 0.30 | 0.62 |

Boiled-off single filaments or fibers were tested on the ***Instron Tensile Tester***. The ***test lengths*** were 3″ for the wools, 0.5″ for the cottons, and 10″ for all filament and tow samples except the "Orlon" tow tested at 300°F., which was 5″. The ***rate of elongation*** was 60% per minute for all fibers except cotton, which was 10% per minute. Relative humidities were about 0% at 210°-400°F., 8% at 70°F., and 100% at −70°F. Each value shown is an average of ***25 determinations***. ***S.D.*** is the standard deviation.

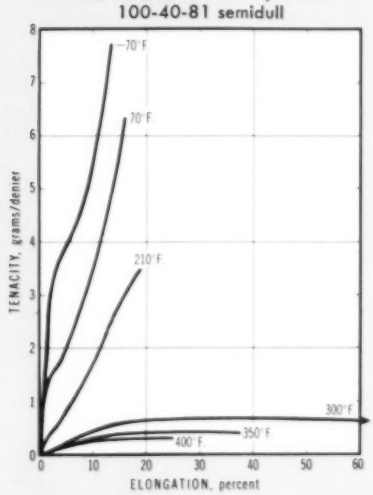
## *In air at various temperatures, continued*

### **NYLON** (66)
40-13-200, 15-1-200 and 3.0-200-Tow semidull



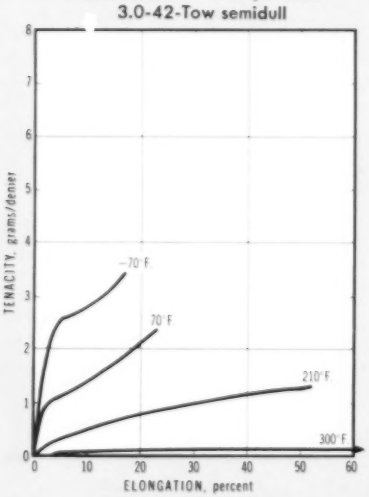

| Fiber—Air Temperature | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 40-13-200 | | | | | | | | | | |
| −70°F. | 3.43 | 6.09 | 1.42 | 19.6 | 1.8 | 0.61 | 0.73 | 1.60 | 1.98 | 3.06 |
| 300°F. | 3.39 | 2.62 | 0.39 | 34.7 | 4.8 | 0.51 | 0.08 | 0.24 | 0.38 | 0.78 |
| 15-1-200 | | | | | | | | | | |
| 300°F. | 16.00 | 2.82 | 0.26 | 39.8 | 6.5 | 0.63 | 0.08 | 0.21 | 0.35 | 0.74 |
| 3.0-200-Tow | | | | | | | | | | |
| 300°F. | 3.32 | 2.36 | 0.55 | 66.0 | 11.4 | 1.00 | 0.06 | 0.18 | 0.27 | 0.53 |

### **"ORLON"** acrylic fiber
100-40-81 semidull



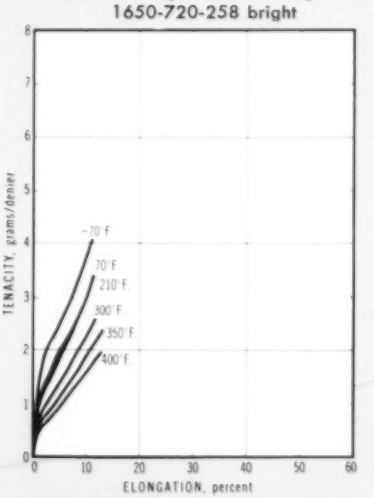

| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| −70 | 2.58 | 7.73 | 1.50 | 13.4 | 3.1 | 0.59 | 1.55 | 3.41 | 3.91 | 5.54 |
| 70 | 2.56 | 6.33 | 0.88 | 15.8 | 3.3 | 0.50 | 1.02 | 1.64 | 2.03 | 3.55 |
| 210 | 2.58 | 3.49 | 0.51 | 18.7 | 1.9 | 0.30 | 0.23 | 0.54 | 0.81 | 1.74 |
| 300 | 2.56 | 0.60 | 0.17 | 78.7 | 15.9 | 0.44 | 0.05 | 0.14 | 0.23 | 0.43 |
| 350 | 2.50 | 0.40 | 0.06 | 37.5 | 9.2 | 0.12 | 0.06 | 0.12 | 0.18 | 0.31 |
| 400 | 2.58 | 0.30 | 0.10 | 24.9 | 8.6 | 0.06 | 0.03 | 0.11 | 0.16 | 0.26 |

### **"ORLON"** acrylic fiber
3.0-42-Tow semidull




| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| −70 | 3.25 | 3.44 | 0.42 | 16.8 | 3.0 | 0.42 | 0.92 | 2.09 | 2.55 | 2.80 |
| 70 | 3.16 | 2.37 | 0.24 | 22.8 | 2.3 | 0.34 | 0.51 | 1.03 | 1.14 | 1.39 |
| 210 | 3.15 | 1.31 | 0.10 | 52.1 | 6.1 | 0.44 | 0.09 | 0.22 | 0.31 | 0.51 |
| 300 | 3.13 | 0.27 | 0.33 | 164.9 | 17.1 | 0.31 | 0.01 | 0.02 | 0.05 | 0.08 |
| 350 | 3.23 | 0.14 | 0.07 | 95.4 | 8.7 | 0.10 | 0.01 | 0.03 | 0.04 | 0.07 |
| 400 | 3.13 | 0.09 | 0.03 | 60.2 | 8.4 | 0.05 | 0.01 | 0.03 | 0.04 | 0.06 |

### **RAYON** "Super Cordura" high tenacity
1650-720-258 bright

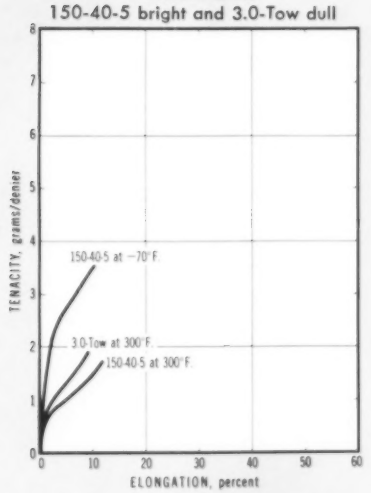



| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| −70 | 2.61 | 4.07 | 0.71 | 11.0 | 2.3 | 0.28 | 1.26 | 2.11 | 2.53 | 3.75 |
| 70 | 2.65 | 3.45 | 0.49 | 11.8 | 2.9 | 0.24 | 1.02 | 1.51 | 1.96 | 3.02 |
| 210 | 2.60 | 3.39 | 0.48 | 11.5 | 2.2 | 0.23 | 0.84 | 1.40 | 1.86 | 2.96 |
| 300 | 2.62 | 2.59 | 0.39 | 11.7 | 2.5 | 0.17 | 0.64 | 1.07 | 1.37 | 2.24 |
| 350 | 2.64 | 2.36 | 0.37 | 13.1 | 2.1 | 0.17 | 0.52 | 0.85 | 1.11 | 1.86 |
| 400 | 2.62 | 1.97 | 0.39 | 12.8 | 2.4 | 0.14 | 0.43 | 0.71 | 0.94 | 1.58 |

Boiled-off single filaments or fibers were tested on the ***Instron Tensile Tester***. The ***test lengths*** were 3″ for the wools, 0.5″ for the cottons, and 10″ for all filament and tow samples except the "Orlon" tow tested at 300°F., which was 5″. The ***rate of elongation*** was 60% per minute for all fibers except cotton, which was 10% per minute. Relative humidities were about 0% at 210°-400°F., 8% at 70°F., and 100% at −70°F. Each value shown is an average of ***25 determinations***. ***S.D.*** is the standard deviation.

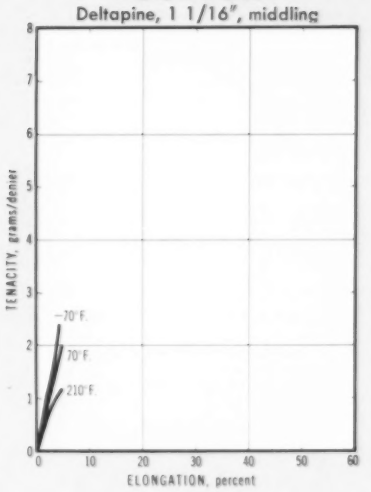
## *In air at various temperatures, continued*

### RAYON
150-40-5 bright and 3.0-Tow dull




| Fiber—Air Temperature | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 150-40-5, −70° F. | 3.90 | 3.56 | 0.36 | 10.3 | 2.6 | 0.26 | 1.33 | 2.33 | 2.72 | — |
| 150-40-5, 300° F. | 3.91 | 1.75 | 0.17 | 11.9 | 2.4 | 0.15 | 0.54 | 0.85 | 1.02 | 1.45 |
| 3.0-Tow 300° F. | 3.14 | 1.92 | 0.33 | 9.2 | 2.7 | 0.11 | 0.32 | 1.06 | 1.32 | — |

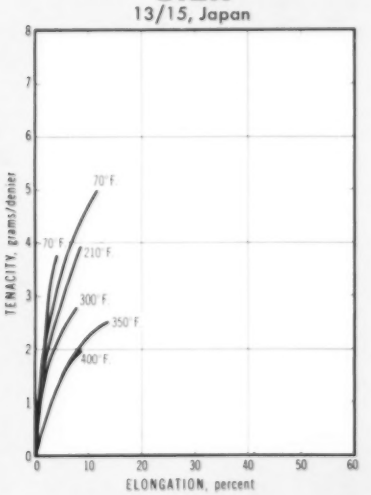
### COTTON
Deltapine, 1 1/16″, middling




| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| −70 | 1.81 | 2.38 | 0.78 | 4.3 | 1.3 | 0.06 | 0.59 | 1.51 | — | — |
| 70 | 1.81 | 1.98 | 0.68 | 4.9 | 2.1 | 0.06 | 0.43 | 1.25 | — | — |
| 210 | 1.81 | 1.17 | 0.52 | 4.9 | 1.9 | 0.03 | 0.32 | 0.89 | — | — |
| 300* | — | — | — | — | — | — | — | — | — | — |
| 350* | — | — | — | — | — | — | — | — | — | — |
| 400* | — | — | — | — | — | — | — | — | — | — |

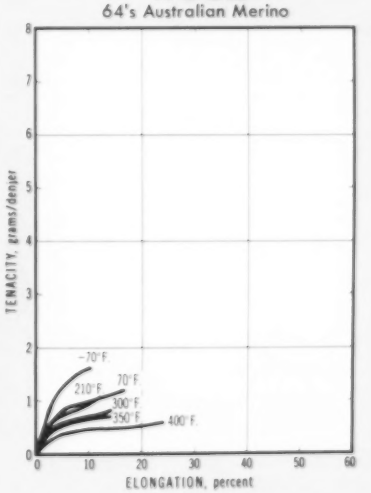
*Unable to test

### SILK
13/15, Japan




| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| −70 | 1.16 | 3.74 | 0.76 | 3.4 | 1.2 | 0.07 | 1.34 | 3.35 | — | — |
| 70 | 1.15 | 4.97 | 1.09 | 11.5 | 3.0 | 0.39 | 1.13 | 2.70 | 3.48 | 4.70 |
| 210 | 1.14 | 3.91 | 0.68 | 8.6 | 2.5 | 0.22 | 1.01 | 2.19 | 2.88 | — |
| 300 | 1.19 | 2.78 | 0.78 | 7.7 | 3.2 | 0.14 | 0.92 | 1.82 | 2.34 | — |
| 350 | 1.22 | 2.51 | 0.56 | 13.6 | 1.4 | 0.14 | 0.40 | 0.95 | 1.50 | 2.24 |
| 400 | 1.18 | 1.95 | 0.71 | 8.2 | 3.6 | 0.11 | 0.42 | 1.05 | 1.49 | — |

### WOOL
64's Australian Merino



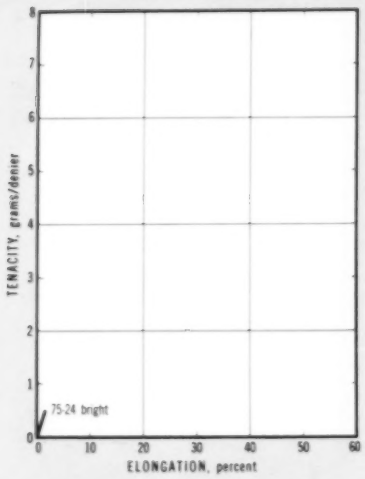

| Air Temperature °F. | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| −70 | 6.17 | 1.61 | 0.37 | 10.3 | 6.2 | 0.13 | 0.36 | 0.96 | 1.26 | 1.59 |
| 70 | 5.87 | 1.16 | 0.30 | 16.4 | 6.5 | 0.13 | 0.39 | 0.63 | 0.82 | 1.00 |
| 210 | 5.37 | 1.08 | 0.42 | 11.9 | 5.6 | 0.08 | 0.26 | 0.60 | 0.74 | 0.93 |
| 300 | 5.62 | 0.82 | 0.17 | 14.1 | 5.5 | 0.09 | 0.22 | 0.48 | 0.60 | 0.71 |
| 350 | 9.70 | 0.72 | 0.20 | 14.0 | 7.3 | 0.08 | 0.18 | 0.41 | 0.55 | 0.66 |
| 400 | 8.06 | 0.61 | 0.30 | 24.0 | 9.1 | 0.10 | 0.12 | 0.28 | 0.37 | 0.48 |

Boiled-off single filaments or fibers were tested on the ***Instron Tensile Tester***. The ***test lengths*** were 3″ for the wools, 0.5″ for the cottons, and 10″ for all filament and tow samples except the "Orlon" tow tested at 300°F., which was 5″. The ***rate of elongation*** was 60% per minute for all fibers except cotton, which was 10% per minute. Relative humidities were about 0% at 210°-400°F., 8% at 70°F., and 100% at −70°F. Each value shown is an average of ***25 determinations***. ***S.D.*** is the standard deviation.

## stress-strain properties of boiled-off fibers

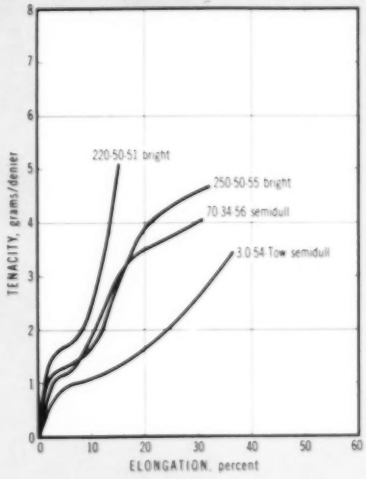
*Loop Test, in air at 70°F. and 65% relative humidity*

### ACETATE



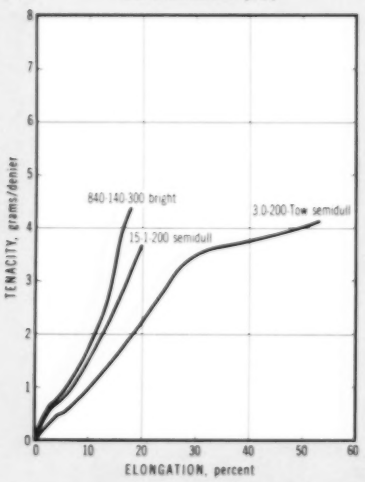

| Acetate Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 75-24 | 6.52 | 0.49 | 0.10 | 1.5 | 0.5 | 0.003 | 0.32 | — | — | — |

### "DACRON" polyester fiber



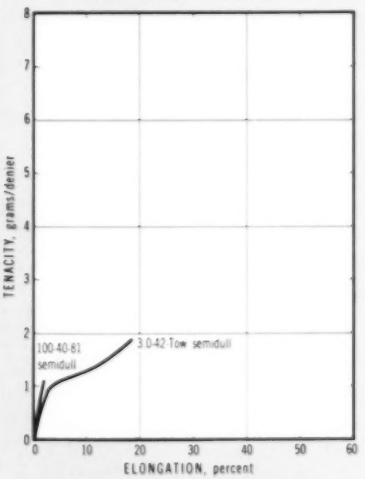

| "Dacron" Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 220-50-51 | 9.49 | 5.09 | 0.94 | 15.1 | 2.0 | 0.32 | 0.90 | 1.54 | 1.68 | 2.48 |
| 70-34-56 | 4.82 | 4.06 | 0.25 | 31.0 | 4.7 | 0.78 | 0.54 | 1.04 | 1.16 | 1.87 |
| 250-50-55 | 11.21 | 4.66 | 0.44 | 32.2 | 5.8 | 0.94 | 0.71 | 1.20 | 1.29 | 1.65 |
| 3.0-54-Tow | 6.54 | 3.44 | 0.77 | 36.6 | 5.7 | 0.69 | 0.26 | 0.70 | 0.90 | 1.10 |

### NYLON (66)




| Nylon Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 840-140-300 | 13.12 | 4.37 | 0.58 | 17.7 | 1.1 | 0.30 | 0.32 | 0.61 | 0.88 | 1.79 |
| 15-1-200 | 31.00 | 3.69 | 0.44 | 19.8 | 2.6 | 0.34 | 0.26 | 0.58 | 0.77 | 1.55 |
| 3.0-200-Tow | 6.83 | 4.12 | 0.57 | 53.3 | 14.5 | 1.45 | 0.12 | 0.34 | 0.51 | 1.00 |

### "ORLON" acrylic fiber

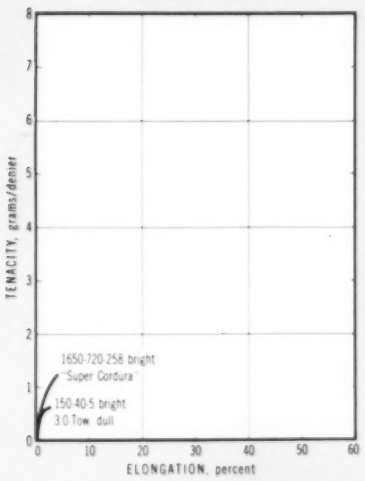



| "Orlon" Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 100-40-81 | 5.12 | 1.10 | 0.28 | 1.6 | 0.7 | 0.01 | 0.76 | — | — | — |
| 3.0-42-Tow | 6.33 | 1.90 | 0.14 | 18.5 | 2.8 | 0.28 | 0.39 | 1.00 | 1.09 | 1.30 |

Tests were made by looping two single filaments over each other and clamping both ends of one fiber in one jaw and both ends of the other fiber in the other jaw of the ***Instron Tensile Tester.*** The denier of the fiber that broke was multiplied by two to obtain the sample denier. The ***test lengths*** were 10″ for all filament and tow samples; 3″ for the wool, and 0.5″ for the cotton. The ***rate of elongation*** was 60% per minute for all fibers except cotton, which was 10% per minute. Each value shown is the average of ***25 determinations. S.D.*** is the standard deviation.

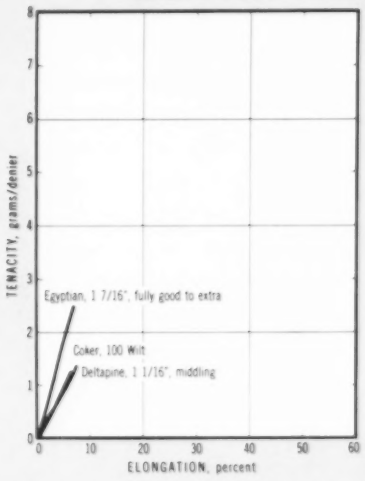
## *Loop Test, in air at 70°F. and 65% relative humidity, continued*

### RAYON



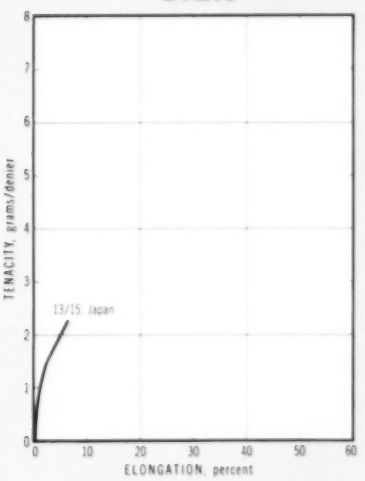

| Rayon Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 1650-720-258 | 5.18 | 1.25 | 0.27 | 4.0 | 1.7 | 0.03 | 0.68 | 1.10 | — | — |
| 3.0-Tow | 6.27 | 0.48 | 0.10 | 0.8 | 0.1 | — | — | — | — | — |
| 150-40-5 | 7.82 | 0.63 | 0.08 | 2.7 | 2.5 | 0.01 | 0.54 | — | — | — |

### COTTON



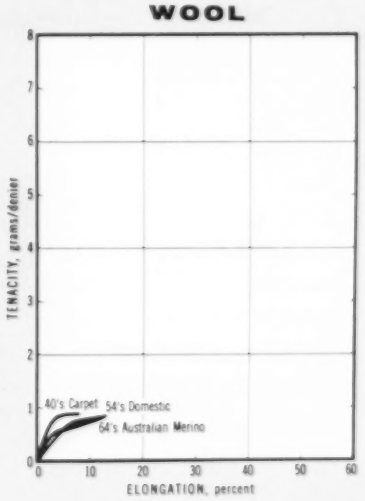

| Cotton Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| Egyptian, 1 7/16" | 2.52 | 2.48 | 0.89 | 7.0 | 2.1 | 0.08 | 0.34 | 1.01 | 1.78 | — |
| Deltapine, 1 1/16" | 3.66 | 1.38 | 0.57 | 7.4 | 2.6 | 0.05 | 0.19 | 0.53 | 0.87 | — |
| Coker, 100 Wilt | 3.60 | 1.25 | 1.81 | 6.5 | 2.3 | 0.04 | 0.18 | 0.56 | 0.94 | — |

### SILK



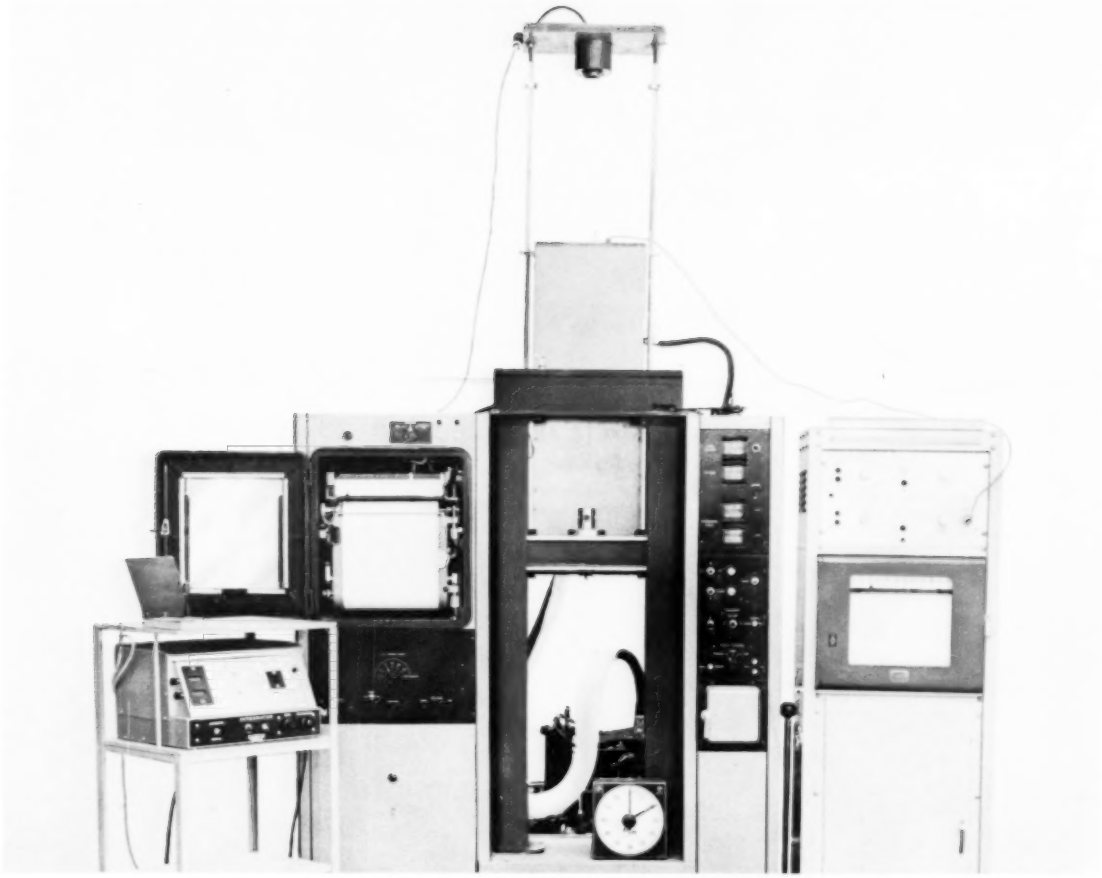

| Silk Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| 13/15, Japan | 2.48 | 2.26 | 0.45 | 6.4 | 2.1 | 0.10 | 0.87 | 1.61 | 1.96 | — |

### WOOL




| Wool Fiber | Denier | Breaking Tenacity gm./den. | S.D. | Breaking Elongation % | S.D. | Work to Break gm.cm./den.cm. | Tenacity (gm./den.) at Various Elongations 1% | 3% | 5% | 10% |
|---|---|---|---|---|---|---|---|---|---|---|
| Carpet | 34.43 | 0.90 | 0.18 | 7.9 | 6.6 | 0.06 | 0.29 | 0.82 | 0.87 | — |
| Aus. Merino | 7.10 | 0.85 | 0.22 | 12.9 | 5.6 | 0.08 | 0.21 | 0.51 | 0.59 | 0.72 |
| Domestic | 13.63 | 0.85 | 0.24 | 13.0 | 5.7 | 0.08 | 0.12 | 0.38 | 0.59 | 0.81 |

Tests were made by looping two single filaments over each other and clamping both ends of one fiber in one jaw and both ends of the other fiber in the other jaw of the ***Instron Tensile Tester.*** The denier of the fiber that broke was multiplied by two to obtain the sample denier. The ***test lengths*** were 10″ for all filament and tow samples; 3″ for the wool, and 0.5″ for the cotton. The ***rate of elongation*** was 60% per minute for all fibers except cotton, which was 10% per minute. Each value shown is the average of ***25 determinations. S.D.*** is the standard deviation.



INSTRON TENSILE TESTER—outfitted with the low temperature chamber

## TESTING CHAMBERS

In Air at Various Relative Humidities—

The chamber was a glass doored copper box (26″ x 10″ x 16″). The chamber was mounted on the Instron in a fixed position above the cross-head. A number of samples could be stored in the back of the chamber. A small metal hook was suspended from the load cell into the chamber through a hole in the top. A rod mounted on the cross-head passed through the bottom of the chamber. Another metal hook was fastened to the top of this rod. A tray in the bottom of the chamber held the chemicals that were used to obtain the desired relative humidities. A fan recirculated air in the chamber over the chemicals. The glass door had a hole covered with slitted rubber diaphragms, through which forceps could be inserted to mount the samples for testing. Temperatures and relative humidities were determined with an electric hygrometer and a psychrometer.

In Air at Various Temperatures—

a. Tests at −70°F. An insulated chamber was used, consisting of a vertical metal tube with refrigerating coils wrapped around it. The chamber was mounted in a fixed position behind the Instron and the Instron load cell was relocated to a position directly above the chamber. The load cell, and upper jaw could be raised from its operating position by two metal rods which passed down the outside of the chamber to a point where they were caught by an extention of the Instron cross-head as it moved up. A glass rod carrying the lower jaw passed through the bottom of the chamber. This rod was raised and lowered by the cross-head and was long enough to protrude through the top of the chamber when the cross-head was raised to its highest point. At this point both the upper and lower jaws were outside the chamber. This enabled the operator to mount fibers in the jaws at room temperature while the temperature within the chamber was maintained at 70°F. The temperature was controlled by a thermocouple.

b. Tests at 210°F., 300°F., 350°F., and 400°F.—
This chamber was mounted in the same way as the low temperature chamber and was operated in the same way. Instead of cooling coils around the chamber, electric heaters were used to heat the air inside. A fan on the chamber circulated the air inside. The temperature was controlled by a thermocouple.

In Water at Various Temperatures—

This chamber was operated in the same way as the air-temperature chambers. It had a water jacket around it in which the water was heated by electric heaters. The water in the jacket was circulated to distribute the heat to the water in the chamber. Temperature was controlled by a thermocouple and a thermometer.

## FIBER CLAMPS

Metal jaws with neoprene faces were used on the Instron Tester for all tests at standard conditions.

For tests at conditions other than standard, punched, metal tabs were cemented to each end of the fiber. The tabs were spaced apart by a distance equal to the test length while attaching the sample. For tests in air at various relative humidities, the tabs on each end of the fiber (except cotton) were fastened to two hooks, one suspended from the Instron load cell, and the other, attached to the Instron cross-head. For all other tests, the fiber tabs were clamped to metal faced jaws.

This Month in . . .
TEXTILE CHEMICALS

## Graft-On Dye Sites?

Hydrophobic fibers that are hard to dye may get a more-dyeable skin from a process called graft polymerization. Dr. H. George Hammon, plastics research specialist at Batelle Memorial Institute, Columbus, Ohio, explains that the process depends on exposing the fibers to high-energy radiation. The radiation alters the material chemically without changing its shape and often without destroying valuable properties.

Another approach, chemical grafting, has been used for some time in the plastics field. Dr. Hammon describes the radiation process as economically feasible at present and one that will develop more rapidly as the costs of high-energy radiation come down.

## Bleaching Time Cut 90%—

A new solvent-based dewaxing process followed by a sodium-peroxide bleach bath produces absorbent, well-bottomed cotton goods in a matter of minutes, according to U. S. Patent 2,790,699 issued to Imperial Chemical Industries, Great Britain.

Hot trichloroethylene is used in enclosed vessels to dewax the fabric. An exposure of 30 to 60 secs. in two consecutive solvent baths produces goods with as little as 0.1% residual wax.

After passing through the hot solvent, the goods are washed in boiling water, which flashes off the solvent. The vaporized solvent is recovered for further use.

The goods are then run into a saturator carrying 10 gpl. sodium peroxide, 5 gpl. sodium silicate, and 0.5 gpl. of a nonionic detergent such as Igepal. The goods, carrying 150% of their weight of the solution, are steamed for 1 min., rinsed, neutralized, and dried.

The desizing is accomplished by oxidative transformation of the starch by the bleaching solution. The small amount of waxes left in the goods is considered to be no deterrent to absorbency or further processing. While no claim is made that the process produces a full white, the drastic cut in chemical costs and time consumed for bottoming as compared to conventional methods should interest cotton processors.

## Wool Shrinkage: a New Attack—

Peracetic acid dissolved in a sodium hypochlorite solution is the basis of a new treatment to reduce wool shrinkage. Developed by Wool Industries Research Assn., Torridon, Headingly, Leeds, Yorkshire, England, the process reportedly leaves the wool with a soft hand. Treated fabrics can be bleached if necessary, and the process can be used either before or after dyeing.

*Please turn the page*

*This Month in . . .*

# TEXTILE CHEMICALS

## *New Color Effects on Wool—*

A new chemical treatment for wool makes it possible to get a variety of colors in one dyebath. Melange effects, one color and white, two colors and white, or three colors are producible by the method.

The process can be applied to scoured wool in any of the usual forms from slubbing to fabric in existing machinery, and it works with ordinary wool dyes. Added advantages of the treatment include a softer hand, better abrasion resistance, and higher insulating value. The process was developed in England by Maifoss Ltd., Syston, Leicester, and is being patented in the U. S.

## *Women Want Wash-and-Wear—*

Women are taking to wash-and-wear fabrics, but they are not as yet completely happy with the performance of the minimum-care fabrics available today.

At a recent Congress on Better Living sponsored annually by McCall's magazine, 100 women told what they're looking for in modern finishes.

First, they want real washability by home-laundry methods, coupled with little or no need for ironing.

**Preferred fabrics are smooth and soft,** particularly shirts, bed linen, and apparel. Crinkly fabrics that are supposed to require no ironing are taboo. "They really look unironed," is the criticism.

They've found that garments made from one fiber are most practical. Nylon bodies with cotton trim, or vice versa, apparently require extra work. Fancy trimmings and puffed sleeves are irksome.

What the spokesmen for 49-million families really want is apparel and domestic fabrics that require no ironing at all. The trend to wash-and-wear is very strong, and fabric finishers will do well to improve their products as rapidly as possible.

## *90%-Amylose Starch Sought—*

How to raise the amylose content of corn starch and how to utilize high-amylose starches were subjects discussed by scientists conferring at Purdue University last month.

Commercial corn starches now available contain about 25% amylose and 75% of amylopectin. Genetic research has developed strains of corn that produce 60% amylose, and geneticists are confident that they can produce a starch with 80 to 90% amylose.

Such a starch would have unusual properties of stretch, elasticity, and strength. It would be insoluble in water and have marked film-forming ability.

Amylose itself appears to have great potentials in fabric finishing.

It can be solubilized by heating under pressure and can easily be insolubilized. It will form cross linkages in the same way that cellulose does and could form the basis of permanent finishes not now available.

Another important application of amylose is as a binder for nonwoven fabrics. It has the necessary strength, flexibility, and resistance to water and at the same time is considerably cheaper than the polyvinyl-chloride or polyvinyl-acetate emulsions that are now used extensively as binders.

Amylose can be acetylated to form clear, tough films reportedly as good as cellulose acetate, but more research is necessary before amylose can compete economically with wood pulp as a base material.

## *Protection for Nylon—*

Nylon can be protected effectively against deterioration by sunlight. Recent tests with resins, latices, and dyes have shown that when nylon webbing is treated with a 4% solution of catechol-formaldehyde, it will retain 92% of its strength after 100 hrs. in the Weather-Ometer. This figure compares with a 76% loss in strength on untreated nylon similarly exposed.

Other factors that improve resistance to weathering are filament size and color. Nylon filament of 15.3 den. is more resistant than 6.2-den. filament. Black or olive-drab fabrics stand up better than undyed material.

A new modified nylon, Type 320, will retain 94% of its strength after weathering without special treatment. The findings were the result of research at the Aeronautical Materials Laboratory, Naval Air Material Center, Philadelphia, Pa.

## *Did You Know . . .*

. . . **that fabrics made of rayon or other man-made fibers** will be attacked by moths and carpet beetles if they are stained? A prize-winning student exhibit at the 14th Annual Teachers' Institute held in New York last month showed moth and beetle larvae busily munching away on stained rayon, rayon-acetate fabric, and a cotton-Dacron-blend fabric. Clean fabrics in these categories and mothproofed wool were left untouched.

•

. . . **that Egypt's native weeds and bamboos** have been found to be an excellent source of cellulose? Experimental work at the National Research Institute at Cairo has been successful in producing a good grade of cellulose from the growths in Delta marshlands and along canals. Egypt now imports several million dollars worth of cellulose annually for its rayon and paper industries.

*This Month in . . .*
**TEXTILE CHEMICALS**

# NEW DYES AND CHEMICALS

## Acid Dye

**Carbolan Brilliant Blue 2G** . . . provides unusually vivid greenish-blue shades that are fast to light and washing. The color was developed for wool but is also suitable for nylon and silk. Imperial Chemical Industries Ltd., Dyestuff Div., Manchester, England.

Circle D-1 on Reader-Service Card

## Print Thickener

**Solvitose C5** . . . is completely soluble in cold water. This starch ether produces smooth, free-flowing solutions suitable for screen or machine printing with vat, soluble vat, or rapid-fast colors. It is not recommended as a thickener for dyes requiring chromium or aluminum salts. Morningstar, Nicol, Inc., 630 W. 51st St., New York, N. Y.

Circle D-2 on Reader-Service Card

## Hosiery Finish

**Lanolube** . . . gives a smooth, firm hand of low luster when it is used in conjunction with polyvinyl-acetate finishes on nylon hosiery. The product is a lanolin emulsion that is compatible with most synthetic resins and dullers. Richmond Oil, Soap & Chemical Co., 1041-1043 Frankford Ave., Philadelphia 25, Pa.

Circle D-3 on Reader-Service Card

## Cationic Softeners

**Ahcovel T** . . . particularly recommended for producing a soft, well-lubricated hand on resin-finished fabrics. The product works well on natural and man-made-fiber fabrics, in pure as well as resin finishes. Resistance to yellowing is excellent to all normal processing, and the product does not retain chlorine or develop odors on storage. The softener is supplied in paste form for quick solubility.

**Ahcovel P** . . . produces a soft hand on cellulosic fabrics finished with or without resins. The product is compatible with most resins and catalysts under normal operating conditions, and it improves the tear strength of resin-finished fabrics. The softener is available in paste or powder form. Arnold, Hoffman & Co., Inc., Providence, R. I.

Circle D-4 on Reader-Service Card

## Dye Retarder

**Crest Retard NM** . . . prevents rapid exhaustion of cation-active dyes applied to Orlon at temperatures above 200° F. The product is used in varying amounts according to the depth of shade wanted and the amount of dyestuff involved. Crest Chemical Corp., 225-235 Emmet St., Newark, N. J.

Circle D-5 on Reader-Service Card

## Softener

**Polytex 201** . . . is a readily soluble product suggested for blending with starches to produce soft, drapy effects. The product is also useful as a grinding medium for colors. Brown-Allen Chemicals, Inc., P. O. Box 1, Port Richmond, Staten Island 2, N. Y.

Circle D-6 on Reader-Service Card

## Optical Brightener

**Leucophor PA** . . . gives brilliant whites on polyamide fabrics. The shade is fast to light, washing, and heat. Application is from an acid bath by exhaustion or by padding followed by steaming. The effect is not destroyed by the heat necessary to form pleats in nylon garments. Sandoz, Inc., 61-63 Van Dam St., New York 13, N. Y.

Circle D-7 on Reader-Service Card

## Metallized Colors

**Calcofast Neutral Red 6B, Calcofast Neutral Yellow G, and Calcofast Neutral Yellow 3 R** . . . are first members of a line of neutral-dyeing metallized colors that are characterized by good fastness, reduced time required for dyeing, small acid requirements, and excellent solubility. Other members of this class of dyes will be available shortly. American Cyanamid Co., Dyes Dept., Bound Brook, N. J.

Circle D-8 on Reader-Service Card

## Direct Dye

**Lumicrease/Cuprofix Navy GLA p.a.f.** . . . is recommended for decorative and automotive fabrics because of its excellent fastness to light, water, and perspiration. The color withstands Cuprofix, Sandofix, or urea-formaldehyde resins without losing fastness ratings. Sandoz, Inc., 61-63 Van Dam St., New York 13, N. Y.

Circle D-9 on Reader-Service Card

## Printing Bronzes

**Bronze Powders** . . . suitable for roller printing are a series of three gold powders. Six dyed gold powders in shades of blue, green, violet, and wine red, and three shades of gold powders are offered for screen printing. Hummel Chemical Co., 90 West St., New York 6, N. Y.

Circle D-10 on Reader-Service Card

## Vinyl-Acrylic Copolymer

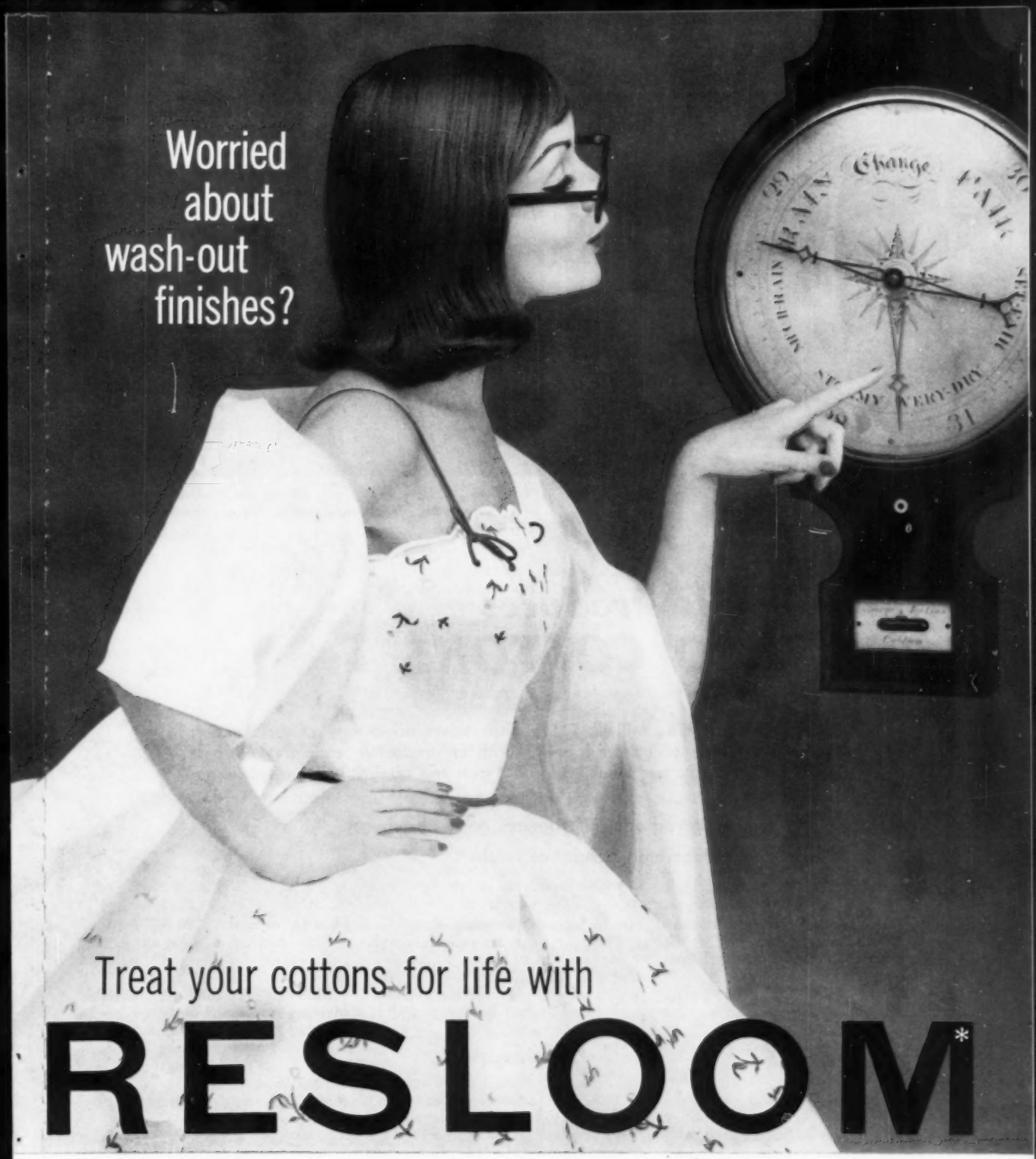
**Resin 2203** . . . forms films of excellent clarity with high oil and water resistance. The product imparts flexible finishes that maintain the glossy or lustrous characteristics of the material to which it is applied. Resin Div., National Starch Products, Inc., 270 Madison Ave., New York, N. Y.

Circle D-11 on Reader-Service Card

## Direct Dye

**Pyrazol Fast/Cuprofix Turquoise FBL** . . . produces bright shades of good fastness to washing, light, perspiration, and gas fading. Suggested for cellulosic fibers, the color is also applicable to silk. Good solubility makes it suitable for application by padding. Sandoz, Inc., 61-63 Van Dam St., New York 13, N. Y.

Circle D-12 on Reader-Service Card



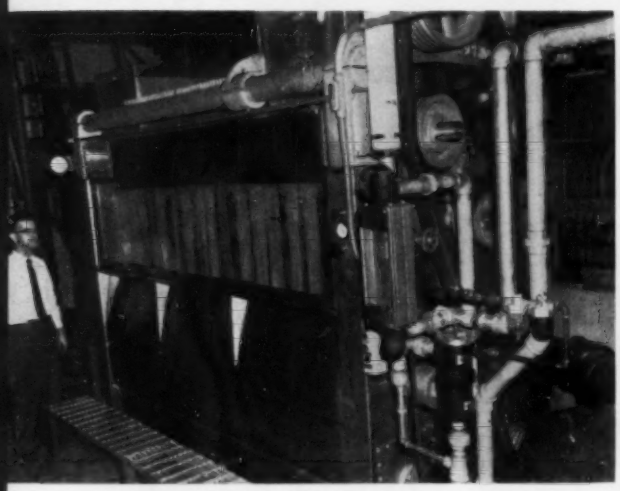

## E-50 cyclic urea resins

Monsanto

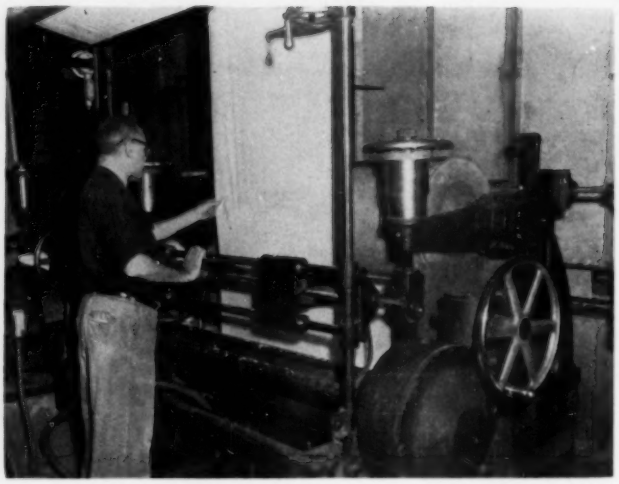
Resloom E-50 doesn't coat the fabric, it "joins" the fiber—and that's why washing won't shake it loose. Resloom-treated cottons require little ironing, stay crush-resistant, won't shrink, sag, or stretch. The finish can be accurately controlled to create a wide variety of hand—from soft and full to firm and crisp.

Ask your Monsanto representative about how you can "treat your cottons for life." Ask also about the other fine Monsanto textile agents: Resloom HP and M-75, the melamine finishing resins; AC Catalysts for fast uniform curing; and Stymer* synthetic Sizes. For technical data and samples, write Monsanto Chemical Company, Plastics Division, Room 496, Springfield 2, Mass.

*RESLOOM, STYMER: REG. U. S. PAT. OFF.



LOW-TENSION WASHERS in the bleaching range are equipped with flow meters and water-temperature regulators to insure uniform washing.



FINISHING PADS are mechanically set and are synchronized with cans and a 90-ft. tenter. Temperature controls help produce uniform results in resin finishing.

# How Millville Produces POLISHED COTTONS

**Millville Mfg. Co., Millville, N. J., has taken advantage of the trend to resin finishing of cotton fabrics. With a productive capacity of up to 1½-million yds. per week, the plant gets top quality in its resin-finished styles by—**

- **Thorough preparation that insures good absorbency**
- **Constant laboratory control of results**

YOU HAVE TO PREPARE COTTON GOODS very thoroughly if the best results are to be expected from subsequent resin finishing.

Millville Mfg. Co. gives careful attention to its preparatory processing to get an absorbent fabric that will soak up resins uniformly and thoroughly.

The plant handles a variety of fabrics including 80-squares, chambrays, warp and filling sateens, sheetings, and lawns. Also included in the resin-finished lines are pocketing and twills that will be used in drip-dry garments.

After the lots have been sewed up in the gray room, the goods are singed and quenched in a starch digestant and hauled into steeping bins. Automatic pilers distribute the fabric evenly in the bin, and it is let lay 8 to 10 hrs. at a minimum so that the starch has plenty of time to convert to more-soluble materials.

Then the goods are pulled through a log washer and into a gray-sour saturator. In this step, weak sulfuric acid is used to continue the solubilizing process started by the preceding enzyme treatment.

### Two-Stage Process Used

The soured goods are laid up in a short J-box for about 30 mins. and are pulled into a low-tension rope washer. Then they are saturated in a solution of caustic soda and piled into the first J-box of a two-stage continuous peroxide bleaching range. Here the goods remain for an hour at 200° F., and then they are hauled through a slack washer in warm water kept at 120 to 140° F., according to the goods.

The bleaching is done by saturating the fabric in a 3% solution of peroxide and holding it in the second J-box for an hour at 190 to 200° F.

Final washing is done in another slack washer, and the goods are piled in white bins to await drying.

Millville processes considerable amounts of colored-yarn dress goods, and for these the bleaching process is modified by substituting a peroxide solution for the caustic in the first stage. Caustic cannot be used because it tends to cause bleeding of colors that are normally fast to less-drastic conditions.

Millville went over to slack washers from the old tight-strand washers common to cotton bleacheries because the newer type of washer is much more efficient, uses less water, and has less tendency to produce biased filling. This last point is very important in resin finishing because once the finish is applied, it is very difficult to straighten out goods that are biased.

Millville mercerizes its plain-dye work going into heavy shades primarily because of the savings that can be made in dye costs as well as for the usual purpose of getting improved luster and appearance.

The plant uses a modern mercerizing range that consists of a water mangle, two caustic saturators with heavy pads, and a 90-ft. tenter. The caustic is washed out partly on the range by hot sprays supplied through a Scott weir system and more completely by wash boxes at the end of the range. Mercerizing is done on both bleached and gray wet goods.

Millville uses both continuous dyeing ranges and jigs to produce a variety of fast-color and commercial dyeings.

### How Resins Are Applied

The plant relies mainly on cyclic-urea resins to produce the basic hand required to obtain a variety of finishes.

The finishing ranges consist of heavy pads synchronized with a stack of eight cans and a temperature-controlled tenter dryer. The goods are saturated in the resin solution and are squeezed out to about 65% moisture content.

If the high-luster effects are wanted on the finished goods, they are run through the range so as to be delivered with a moisture content of 10 to 15%.

The next step is calendering, and the type and extent of luster wanted determines the kind of calender to be used. Friction calenders, Schreiner calenders, embossing calenders, and plain rolling calenders are used to create various end effects.

The polished-cotton effect is produced on Schreiner calenders. These calenders are two-roll machines in which the top roll is engraved with fine lines set at a 45° angle to the center line of the roll. The lower roll is usually a very dense cotton roll. The top roll is gas-fired to a temperature of 350 to 400° F.

Pressure up to 50 tons is applied to the cloth as it is passed through a Schreiner calender at about 25 yds. per min.

The excess moisture in the goods at this point helps in obtaining the maximum luster and is necessary to the permanence that is characteristic of resin finishes.

Glazed-chintz effects are processed on the friction calenders. In these machines, goods are first passed between a steel and a cotton roll and then under a heated steel roll in contact with the cotton roll. The heated roll is geared so that its surface speed is about 50% faster than that of the cotton roll against which it bears. The resulting friction produces the highest luster possible by mechanical processing.

Some work goes to embossing calenders that impress a pattern on the goods. In these calenders, a heated steel roll engraved with the wanted pattern works against a dense cotton roll; and as the cloth passes between the two rolls, the pattern is transferred to the fabric. These calenders use a hydraulic system to develop up to 30 tons pressure.

Straight rolling calenders are also used on resin-finished goods to develop certain hands but do not produce as much luster as the Schreiners or friction calenders.

After calendering, the goods are cured in roller-type curing ovens. The ovens are gas-fired and are set to maintain temperatures of 300 to 400° F., according to the type of goods.

The average curing time is 1½ mins. at 350° F. but may be as much as 3 mins. at 300° F.

The curing is a critical step, and the ovens are checked periodically to be sure that goods come up to the full curing temperature promptly, held long enough at that temperature, and then cooled slightly in the last few yards of travel.

To remove traces of uncured resin and free catalyst and to adjust the pH if necessary, the goods are washed in the open width in a weak solution of soda ash plus Igepon. A pad is used to apply the alkali and detergent, and two wash boxes are used to rinse the goods.

The final step is another run on a tenter frame to bring the goods to uniform width and adjust the finish if necessary. Customer requirements often dictate slight modifications in hand that are most easily produced in this final run.

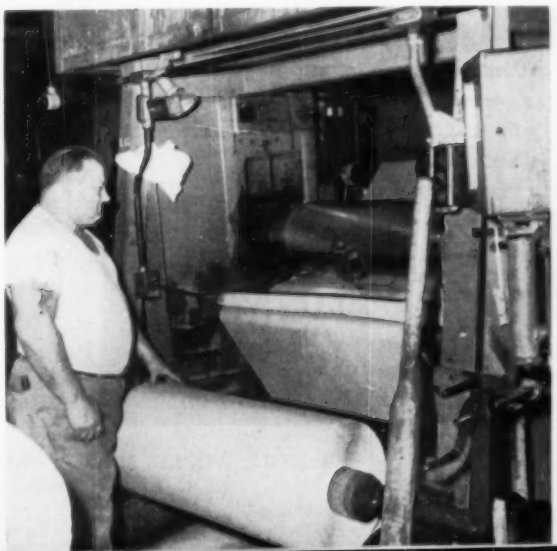
### Testing Maintains Quality

Each lot of resin-finished goods is checked by the mill laboratory to be sure that the tensile strength, crease recovery, shrinkage, and permanence of finish are up to the quality standards set for each type of cloth. Finishes that are produced under license are also submitted to the licensor, who further checks them to be sure they are up to standard.

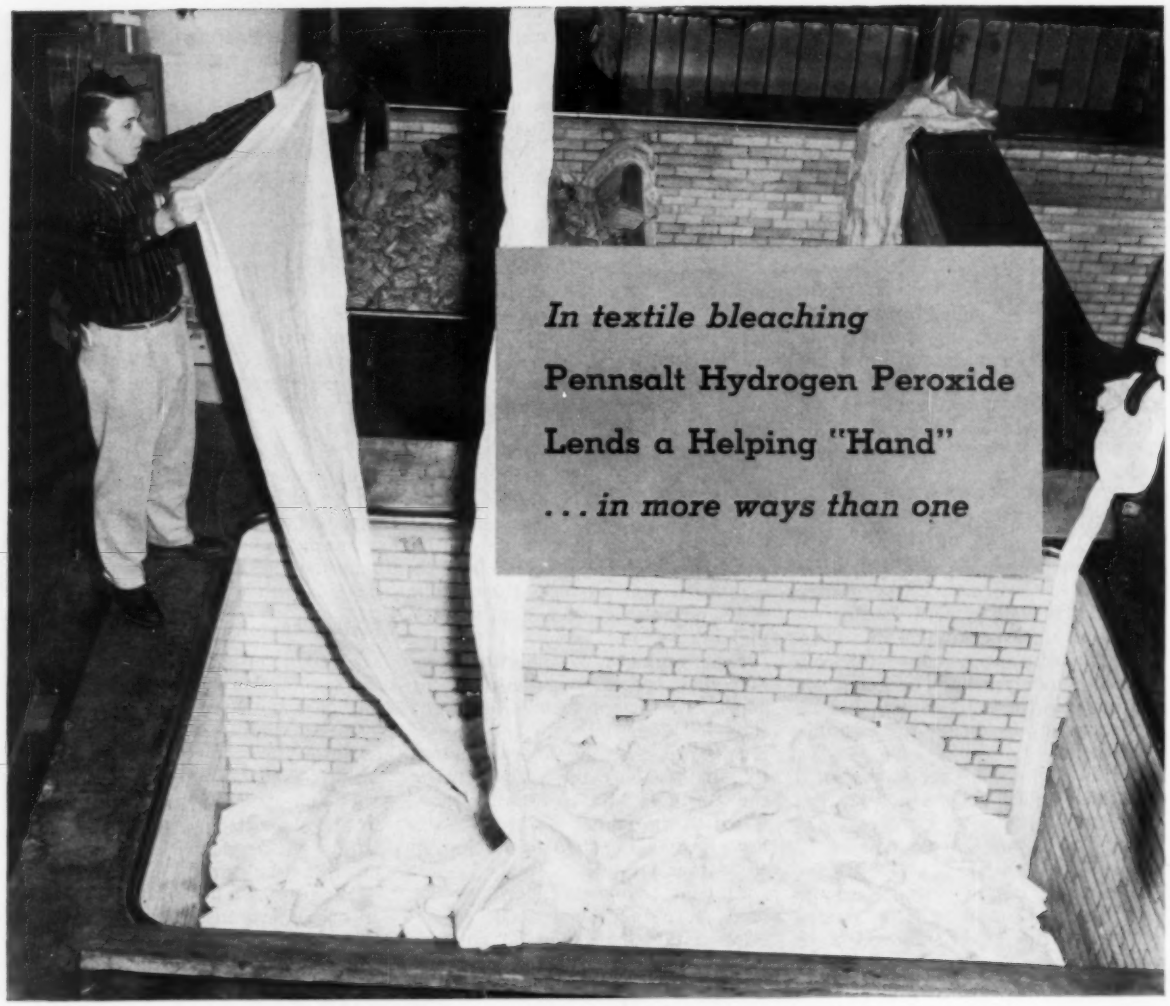
The plant also markets nonmechanical resin finishes under its own brand name of Woodset. These include water-repellent, wash-and-wear, and nonchlorine-retentive types.

Millville's success with resin-finished cottons is a result of a combination of proper processing with a rigid program of quality control plus a final inspection for quality.

**POLISHED COTTONS** are produced under 50-ton pressure in Schreiner calenders. The steel roll is heated to 350 to 400° F. by gas. The nip is opened at the seams by an automatic tripper.



**LABORATORY CONTROL** is an important factor in producing resin-finished goods. Here samples are being checked for angle of recovery in Monsanto testers.




A good "hand" adds sales appeal to your fabrics. And you'll get that superior feel, plus clear, long-lasting whiteness . . . on cottons and linens, as well as on silk and wool . . . with Pennsalt controlled-process hydrogen peroxide.

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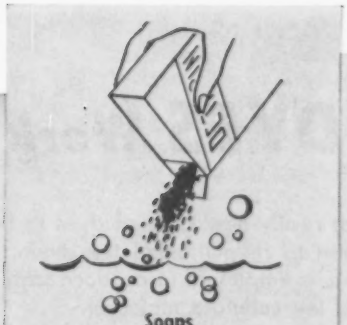

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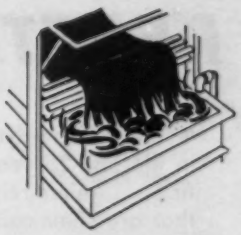
Synthetic Detergents
Alkaline Cleaners



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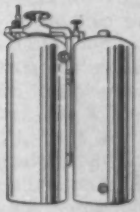

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# How REACTIVE DYES Work

**• The Procion dyes are the first really new class of dyes to be discovered in the last 25 years and promise to revolutionize the dyeing of cellulosic fibers. An entirely new principle is employed to produce fast, bright colors that are chemically attached to the cellulose molecule.**

THE DEVELOPMENT OF THE PROCION OR REACTIVE DYES provides a third method of coloring cellulosic fibers. The earliest method—direct adsorption of color by the fiber—is familiar as direct dyeing, and its limitations are well known. The second method is typified by the azo, sulfur, and vat dyes, which are applied in a soluble state and converted to an insoluble state. Improved fastness to washing is a result of insolubilizing these classes of dyes within the fiber.

The reactive dyes form a chemical bond with cellulose to produce the third system—a chemical bond between dyestuff and cellulose.

### Dyes Are Simple

The reactive dyes actually have little affinity for cellulosic fibers. Because they are of low molecular weight, these colors diffuse easily into the cellulose molecule; and their simple structures are productive of generally brighter shades.

The reactive dyes have several sulfonic-acid groups in their structures, which makes them highly soluble in water and reduces their affinity for cellulose. The lack of affinity is a decided advantage because there is less tendency to produce unlevel dyeings in batch processes; and in continuous processes, tailing-out of color from one end of a run to the other is practically eliminated.

Built into the dye molecule is the reactive group of chlorine atoms that, under the proper conditions, will combine with the OH group in the cellulose chains to form a new compound of cellulose plus dye.

### Bond Makes Color Fast

The fiber-dyestuff bond is more stable than the physical adsorption effect that is responsible for the usual direct dyeing and produces dyeings that are very fast to most color-destroying influences.

*From a paper delivered by T. Vickerstaff before The Fiber Society, Inc.*

There is also a reaction of the dyestuff with the water involved in dyeing, but the by-product is a hydroxy derivative of the dye that will not attach itself to cellulose.

The factor of reaction time is added to those of diffusion and affinity when the reactive dyes are used.

The primary desirable reaction is the fixation of the dyestuff to the fibers. Laboratory work done to date shows that within 15 secs. of the time when the dyebath temperature and pH are adjusted to optimum conditions, the dye has reacted with the cellulose up to the maximum amount possible with the particular dye.

The secondary reaction of hydrolysis with the water in which the dye is dissolved appears to be accelerated as pH and temperature are increased and varies with the dyestuff.

Both dye fixation and hydrolysis are brought about primarily by raising the bath pH.

### How Reaction Is Controlled

In continuous dyeing processes, both the reactive dye and the activating alkali are padded on at the same time. Stable dyebaths of this type may be set up using sodium bicarbonate as the activator. Cloth padded in this type of dyebath must be heat-treated to develop the color or let stand overnight.

Sodium carbonate added to the dyebath will accelerate the action but should be added to the pad box from a separate supply so as to reduce the amount of dyestuff that is hydrolyzed and rendered useless.

In any case, some dyestuff is going to be hydrolyzed before it can be fixed on the fiber. This loose color must be removed by washing or the true fastness of the fixed color will be obscured.

In batch-dyeing methods, the usual method is to work the goods cold for about 30 mins. in a neutral bath containing the color. Then a mild alkali such as sodium carbonate, sodium silicate, or trisodium phosphate is added to produce a pH of about 11.

Up to this point there is some evidence of dyeing, but exhaustion is poor. There is good leveling and diffusion at this stage; and when the alkali is added, the dyestuff in the fiber is rapidly fixed. The equilibrium of the dyebath is upset, and activated dye begins to diffuse into the fiber. The reaction of the dye with the cellulose is to some extent incomplete because of the hydrolysis of the dye with the water.

Fibers exhibit a ring-dyed effect as the dyeing time at pH 11 is extended, but the color is fast. There is, of course, no leveling in in this phase of the dyeing.

### How Theories Were Developed

What happens when a reactive-dye solution acts upon cellulosic fabric has been worked out to a satisfactory agreement between theory and practical effect.

The three functions of reaction rate, diffusion, and fixation were examined by various methods.

Reaction rate was assessed by dyeing viscose film in a solution containing: 0.33 grams per liter Procion Red 2BS and 30 grams per liter common salt at 30° C. until equilibrium was reached. Pieces of dyed film were then immersed in a 10-grams-per-liter solution of sodium carbonate with 30 grams per liter of common salt, for times ranging from 15 secs. to 12 mins. The samples were then boiled for 10 mins. in two grams per liter of Lissapol NC, squeezed out and examined optically. There was no significant difference in color density between the 15-sec. immersion and the 12-min. immersion. Exposure of dyed, air-dried films to ammonia vapor showed maximum reaction within 5 secs.

The reaction time for the hydrolysis of a Procion dye by water is consistently reduced by increasing the pH and raising the temperature. Adding electrolyte also influences hydrolysis to some extent, and there are variations in the behavior of different Procion dyes under the same conditions.

To get maximum fixation of dye on fiber and a minimum of hydrolysis of dye, pH must be controlled and bath temperatures regulated to suit the dyes involved.

### How Diffusion Was Estimated

The rate of diffusion of the reactive dyes into the fiber is an important factor, particularly in batch dyeing, because hydrolytic action is competing for the dyestuff in solution.

Studies were made with reactive dyes and completely inactive dyes (bearing a hydroxy rather than a chloro derivative) in neutral solutions to find the diffusion rate into viscose film.

These experiments showed that the rate of diffusion for both reactive and inactive forms of the dyes increases as temperature increases and varies with the dye being tested. Tests were made at 25, 30, and 35° C. At the 35° C. point, diffusion rates were 50 to 100% faster than at 25° C.

Trials to determine diffusion rates were made on viscose yarns, and comparisons between the theoretical amounts of dye that should be fixed on the fiber with the actual amounts determined by analysis were in good agreement.

The work was carried out at temperatures of 25, 30, and 35° C., as with the film, and showed that the higher the temperature, the less the amount of dye fixed on the fiber. The effect of higher temperatures increases the rate of hydrolysis as well as diffusion; so one effect almost cancels out the other.

To get the maximum amount of dye fixed on the fiber, the application temperature should be low.

### pH Determines Fixation

The optimum pH for good dye fixation varies with the particular dyes, but there is a definite pattern of rise and fall of the percentage of fixed dye as the pH varies from 8 to 12.

It is in the range of pH 10.5 to 11.0 that the highest fixed-dye percentages are found.

There is a balance between dyeing time without alkali, temperature, and pH that produces the best effect from each dye.

The experiments for determining the optimum dyeing temperature and the best pH for fixation were followed by trials to determine the effect of extended dyeing time on the percentage of fixed dye. In this experiment, viscose skeins were dyed for 30 mins. at 20° C. in a 1.5% solution of six Procion dyes at a bath ratio of 30 to 1, with 50 grams per liter common salt.

At pH 9.5, the effect of time was quite pronounced: 40% of the color was fixed in 1½ hrs., and 60% was fixed in 6 hrs. But at the optimum pH of 10 to 10.5, extra time did not increase fixation of color.

At higher pHs, hydrolysis accounts for greater portions of the dye; and the amount fixed on the fiber decreases regardless of time.

The experiments and data listed here are applicable only to the highly reactive dyes of the Procion type.

A new series called Procion H dyes are less reactive and require heat for fixation, but they are more stable in the presence of alkalis and have more affinity for the fiber.

The preliminary work with this new class of dyes points out the possibilities and dyeing methods that have already been evolved and lays the groundwork for the complete theoretical treatment that will develop as experience with the dyes becomes more extensive.

## Humanics—A TW Brief

### Emphasize the Right Point

Often a supervisor leaves the wrong impression with an employee after a discussion about some phase of the employee's duties.

Starting out with specific instructions as to how to do the job, the supervisor may leave the subject and drift into an entirely different field. What he ends up with may stay in the worker's mind long after the instructions he got earlier in the talk.

Such a reaction can easily occur, especially if the supervisor slips off into disciplinary matters and if the employee is particularly sensitive to criticism.

As an illustration, take the case of Tony, an Albanian immigrant, who was an excellent worker but had little command of English. His job in a bleachery was to see that each kier load of goods got a certain amount of caustic soda, which was supplied from mercerizer wash waters stored for the purpose.

Because the caustic supply varied in strength and temperature, Tony was supplied with a hydrometer and a thermometer to gauge the caustic content of the wash water. Both instruments were vitally necessary if the caustic content of each kier load was to be constant.

One day Tony broke his thermometer and went to the boss bleacher for another. He got it—and along with it a lecture on carelessness for breaking equipment. The importance of the thermometer in his work became relative—from what he'd just heard, the important thing was not to break it.

So Tony went back to his job, and sooner or later he broke his thermometer again. This time, he said nothing.

Before a week was out, the plant was in trouble with damaged goods, and only after several weeks of hit-and-run trouble was the source of the damage traced to the kier room. Tony had been loading in caustic without a thermometer; so when the caustic temperature was high, the hydrometer alone had given a false reading and the excess caustic content of the kier loads had damaged the fabric.

Tony was to blame, of course. He knew he should check caustic temperatures as well as degrees Twaddle. But the blasting out he'd got about breaking the other thermometer had stuck in his mind. He chose to guess at temperatures rather than to be bawled out again and perhaps fired.

It is true that Tony's judgment was faulty, but his boss was almost equally to blame. He'd unwittingly left Tony with the impression that preserving thermometers was more important than using them.

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Background fabric: Penline by M. Lowenstein and Sons, Inc. Cotton.



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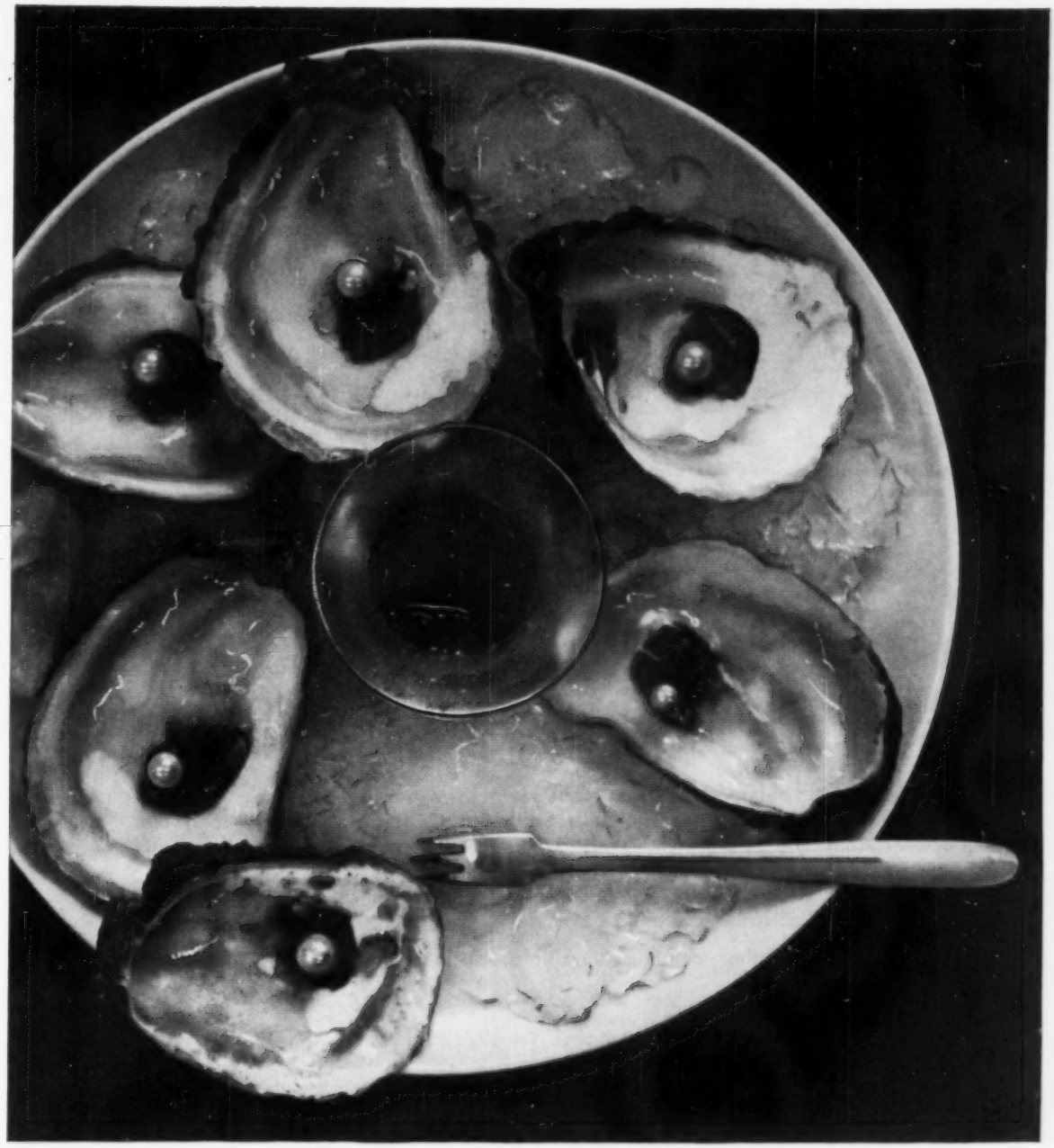

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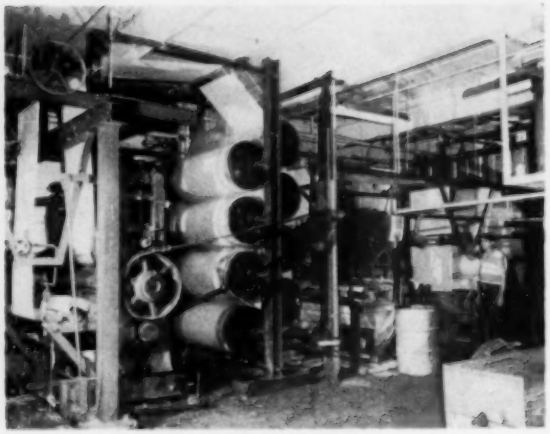
FIRST STAGE of continuous bleaching is a caustic impregnation. Here the operator adjusts the flow of fresh caustic into the saturator. Goods enter left and are hauled up to the J-box.



CONTINUOUS FINISHING backs up continuous bleaching in this drying and finishing range that will handle 60-in. goods. Plain or back starching is possible as needed.

# TWO-STAGE BLEACHING
## Gives Startex Good Results

**You can get good whites on carded-yarn towelings in a continuous peroxide-bleaching system. Startex Mills, Startex, S. C., has been doing it for years. According to the style involved, the bleachery may—**

- **Pretreat in caustic, bleach with peroxide**
- **Use peroxide in both J-boxes**
- **Follow either method with a light chlorine bleach**

STARTEX MILLS' BLEACHERY is geared up to run 750,000 yds. per week in a two-stage bleaching range that produces good whites on carded-yarn fabrics.

The plant's lines include cotton-huck toweling in various constructions and weights and crash weaves in all cotton or cotton-linen blends.

The bleaching problems presented by these types of fabrics are mostly tied in with the foreign matter that is usually present in carded-yarn fabrics. Another factor to be considered is that many of the towelings have colored stripes or checkered patterns.

The colored yarns are either vat dyed or naphthol dyed and will not stand the strong caustic liquors used as a first stage in the bleaching process.

For all-white huck or crash toweling, the first step is to saturate the goods through the singe-desize unit in a hot solution of detergent built with an alkali. The towelings are not singed but are hauled directly into bins for a 6- to 8-hr. layover period during which the sizing material and natural impurities are softened and made ready for removal.

From the desizing bins, the goods are pulled into a log washer. Warm water is used in the washer on the counter-current principle to remove a good deal of the size and dirt softened up by the desizing operation.

The washer does not carry a squeeze roll, but excess water is removed by a separate squeezer unit at the delivery end of the washer.

The goods pass directly from the washer into a caustic-saturating pit carrying a 3% solution of caustic soda and are squeezed out and piled into the top of the first-stage J-box.

The J-box holds the goods for 1 hr. at 200° F.; and they are then pulled through to two log washers, each equipped with a squeezer unit at the delivery end. Warm water is also used at this point to wash out impurities and excess caustic.

The bleaching stage is set up in similar fashion, but the causticized and washed goods are saturated with a peroxide solution and led into another J-box where they are held for 1 hr. at 200° F.

The peroxide solution is varied in strength from 1 to 3% according to the goods going through.

When the goods leave the bleaching stage, they are pulled through a log washer carrying warm water. Then they are completely neutralized in a second log washer carrying cold water

into which $SO_2$ is bubbled. The toweling is then piled into white bins to await finishing.

Colored-yarn towelings are given the same desizing treatment as the all-white fabrics, but they are not given a preboil in caustic soda. Instead, the first saturator carries a peroxide solution and the goods go from this first stage into another peroxide-bleaching bath and J-box.

Washing between stages and after the second stage is the same as for all-white fabrics. An exception is where naphthol colors have been used in the stripes or patterns. In these cases, the goods are taken from the second-stage washer and put through a chemic saturator, squeezed out, and piled in a J-box. They are retained here for 30 mins. and then washed and scoured in $SO_2$ in a log washer.

The chemic acts to clear up any small amount of staining that may have been caused by the peroxide.

### Two Finishing Ranges Are Used

Startex has two finishing ranges, one set up to handle the narrow towelings and the other to carry tablecloth fabrics up to 60 ins. wide.

The toweling range consists of a water mangle, a stack of 8 cans, a starch mangle, a Tommy Dodd back-starching pad, and a stack of 30 cans. A 90-ft. gas-fired tenter completes the drying and finishing to width. This range is not hooked up continuously because of the considerable variation in width between different styles of toweling.

The wide range consists of a water mangle, 8 cans, a Tommy Dodd back-starching pad, a regular starching pad, 30 cans, and a 90-ft. gas-fired tenter.

A heavy, three-roll calender is set up at the delivery end of the wide drying range; and a six-roll calender completes the finishing steps possible on the narrow range.

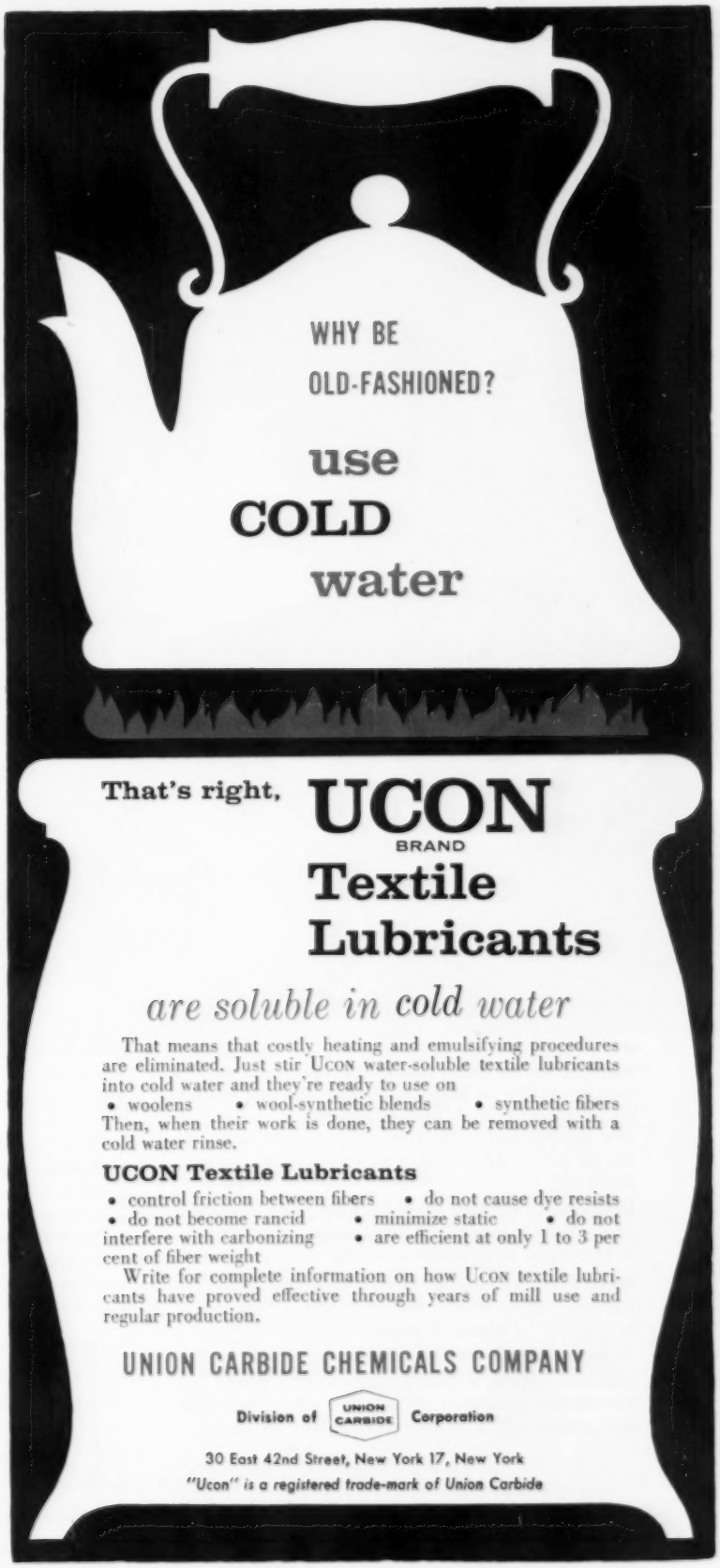
Both calenders are used considerably to get luster and the right hand on tablecloths and crash toweling.

### Wet Finishing Prevails

Startex's ranges are set up so that the goods are first evenly wet out in the water mangle and then partially dried on the short stack of eight cans.

To get the crisp, linen-like effect expected in tablecloths and cotton or cotton-linen crashes, Startex applies corn starch plus softeners on the starch mangle.

After finishing, the goods are delivered to the fabricating and packing department to be made up into finished towels, napkins, and tablecloths; or they are shipped out on bolts or by the roll to other processors.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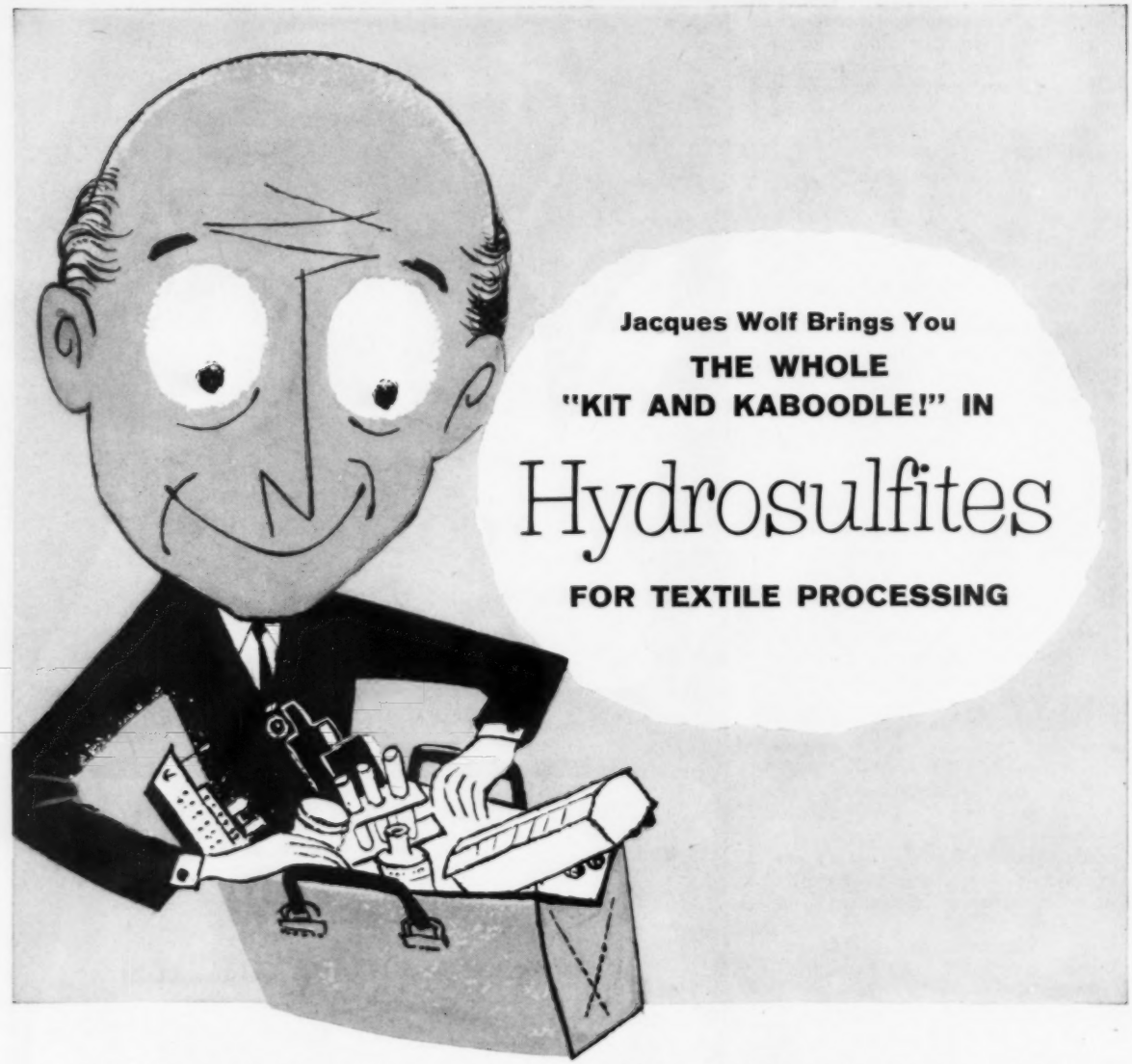

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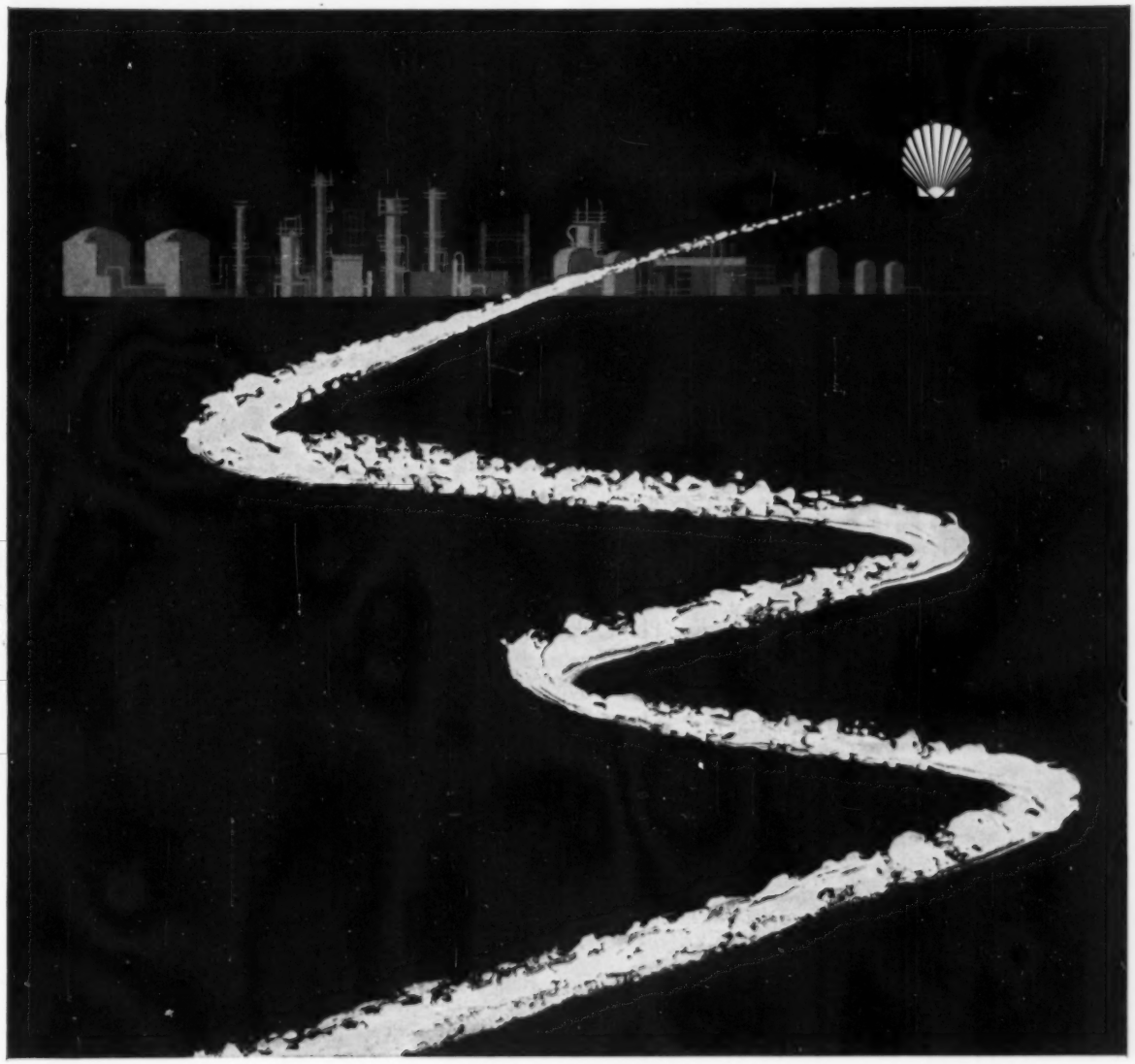

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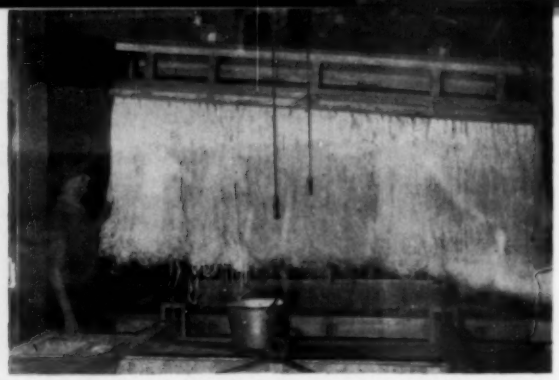
ZIPPER TAPE is loaded on stainless-steel rods placed in the yarn carrier of a conventional Hussong-Walker-Davis machine. Each rod will carry about 30 lbs. of tape.



BLEACHED TAPES are being lifted from the bleaching bath. Final step is to give the load an optical bleach in another tank nearby. The bleach bath is left standing.

# *How Caledonian Dyes* ZIPPER TAPES

**Caledonian Dye Works, Philadelphia, Pa., keeps several yarn-dyeing machines busy dyeing zipper tapes and selvage strips from curtain manufacturers. The Hussong-Walker-Davis machines used for the process have proved well adapted to—**

- **High production**
- **Even dyeing**

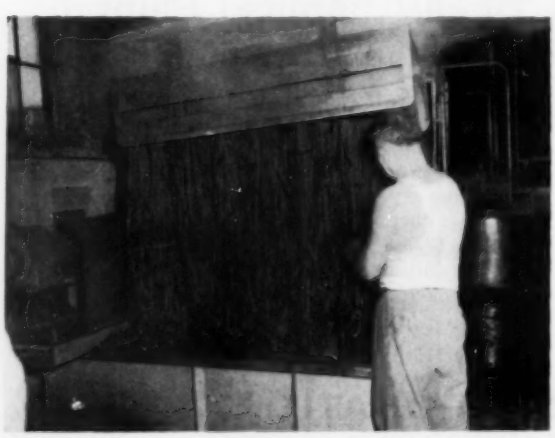
BY USING A LITTLE IMAGINATION, Caledonian Dye Works has been able to supplement its cotton-yarn-dyeing business and keep its machines busy dyeing narrow fabrics.

The plant is equipped to handle loose warps, packaged yarns, and skeined yarns. The latter are dyed in a battery of stainless-steel Hussong-Walker-Davis machines that have a total capacity of 3,200 to 3,500 lbs. of yarn at one time.

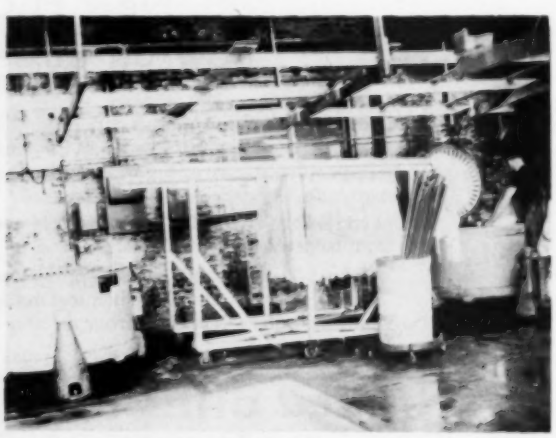
The transition from yarn to narrow fabrics was actually very simple. The plant receives the zipper tape wound in hanks, which are loaded onto the Hussong machine racks. About 30 lbs. of tapes are loaded on each stick in the rack.

### Here's a Dyeing Routine

Caledonian uses direct, sulfur, vat, and developed colors for the tapes, depending on the customer's requirements. Except for very light, bright shades, the tapes are not bleached before dyeing.



CHECKING SHADE on a partially dyed lot, the operator clips off a sample from the end of a hank. Dry color is added directly to the bath if needed and given time to dissolve completely.



BLEACHED TAPES are loaded into a hydroextractor to get rid of excess water. The hanks have shrunk in dyeing, a desirable feature in the finished zippers going into garments.

For direct or sulfur colors, the tapes are entered into a bath containing a wetting agent, the temperature is raised to 200° F. and the liquor is pumped through the machine for 15 to 20 mins. The Hussong machines are equipped with an automatic timer that reverses the flow of liquor periodically to help in producing even dyeings.

After the wetting-out period, dyestuff is added directly to the bath and the load is let run 30 mins. Salt is added to exhaust the color. If it is necessary to add color, the load is hoisted out of the machine and color is added to the bath. After a minute or two to insure thorough solution and distribution of the added color, the tapes are lowered into the bath and dyeing continues until the shade is matched.

For sulfur dyes, the preparation is similar but the initial charge of dye is run for an hour before salt is added. When sampling indicates that the base shade has been reached, a hot-water wash at 140° F. is given.

This wash is followed in some cases by an oxidizing bath of sodium bichromate and acetic acid. Another hot rinse follows oxidation, and then the load is soaped at the boil for 20 to 30 mins. and given a final rinse. Oxidation on some shades occurs readily enough during a series of three hot rinses given the goods after dyeing.

There is considerable call for white zipper tapes, and for this business Caledonian uses a 1,000-lb.-capacity machine.

The charge for bleaching a 1,000-lb. load of tapes is:

80 lbs. 35% peroxide
20 lbs. sodium carbonate
5 lbs. sodium silicate 35° Be.

The goods are entered into this bath, and the temperature is run up to 200° F. and maintained for 2 hrs. They are then hauled out and transported on a monorail conveyor to another Hussong machine and given an optical bleach to complete the process. The bleach bath is kept standing and is boosted with 60 lbs. of peroxide for each succeeding load of goods.

After bleaching or dyeing, the hanks of zipper tape are loaded on racks and taken to a hydroextractor where excess water is removed. The tapes are dried on poles in a cabinet dryer and from there are packed in cartons for shipment to customers.

An interesting item in Caledonian's production is the selvage trimmings produced by curtain manufacturers. These strips average 1 to 1½ ins. wide and are bought by a manufacturer of hooked rugs. The trimmings are received at the dyehouse in hanks and are handled exactly as the zipper tape.

*(Advertisement)*

WHAT YOU SHOULD KNOW ABOUT STARCH*

# *Why CORN STARCH is used for Textile Sizing*

By J. M. SEITZ
Director of Research
The Hubinger Company

FROM the beginning of textile sizing down through historical times, the reason for the use of starch for sizing could best be defined by the words **adequate, available** and **economical.** Certainly other plant gums and exudates were used long before the discovery of starch, only to be displaced by the more available and economical starch.

More or less pure forms of rice, sago and wheat starches were known to the ancients and used either as cosmetics, foods or textile sizes. It remained for the discovery of the Americas to introduce corn starches to the world. Recently the grain sorghums have been added as a source of starch.

The greatly increased demand for starch during the 19th century both enabled and forced the development of the corn starch industry to meet the demand by utilizing the very dependable corn supply. The technological advance in corn starch production and adaptation to textile sizing has continued at an increasing pace throughout the first half of the 20th century and is continuing today. It is evident that research will continue to enhance the position of corn starch as a textile size.

In a modern, efficient textile mill any raw material or process adjunct must be adequate to do an extremely good job. It must by all means be constantly, conveniently available, and finally its price must be reasonable and fair. Does Corn Starch meet these specifications?

Past and present usage indicates that corn starch or a modified corn **starch is a very adequate size.** It is obvious that the changing fashions, fibers and processes of the modern textile scene require proper adaptation of corn starch or its modifications. However, in cooperation with the textile mills these adaptations are being made by alert research groups. Where necessary, corn starch is further modified to fit the special needs.

The **availability** of corn starch is based first on that unique phenomenon, The Bumper American Corn Crop, and secondly on the year-round production of the corn refining industry. Our salesmen are out to sell **More Corn Starch** but we can always raise production. Because of the ready **availability** of corn starch the inventory can be safely kept at a level to meet all immediate needs. All these things as well as a reasonable base price also enter into the genuine **economy of corn starch** for textile sizing.

Finally we would like to add, we believe that service goes both **ahead** of, and **with** sales. We would like to help with your problems.

*** ONE OF A SERIES OF ARTICLES. FOR THE COMPLETE SET AND FOR OUR CONTINUING TECHNICAL DATA SERVICE, WRITE WITHOUT OBLIGATION TO**

**The Hubinger Company**
**KEOKUK, IOWA**



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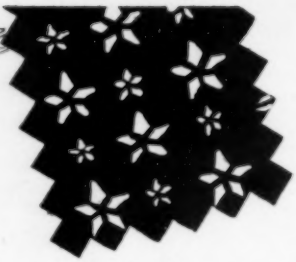

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| Fastness to light: | Excellent |
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| Fastness to chlorine: | Very good |
| Dischargeability: | Perfect |

No tendering of cotton in heavy calender finishing.

**Also: Charcoal and neutral GREYS on Naphtol AS-ITR etc.**

**FOR YARN:** On as little as 2% Naphtol AS-SW a jet black can be produced on packages with a very good light and peroxide bleaching fastness.

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**Caustic Soda**

**Lauryl Pyridinium Chloride**

**Chlorine**

**Carbonate of Potash**

## 40-page manual tells how to handle caustic soda

Written from beginning to end with the engineer in mind, this new Hooker manual sums up techniques for getting liquid caustic soda from the tank car into a process.

Among its contents are detailed equipment diagrams, a section on materials of construction, recommendations for unloading, diluting, piping, and storing caustic soda, and a section on safety precautions and first aid.

All in all a useful, compact book for the man responsible for caustic soda handling.

Check the coupon for a copy of Hooker Bulletin 102, *Caustic Soda Engineering and Handling Guide.*

## Do you have trouble with spinnerettes?

One cause of higher costs in making rayon is to be plagued with clogged-up spinnerettes.

This is probably why a lot of our lauryl pyridinium chloride ends up in rayon plants. In the spinning bath solution, this chemical keeps spinnerettes clear of suspensions, reaction products and impurities of various kinds in the viscose solution. Among the impurities washed away by this detergent are precipitated cellulose, sulfur deposits, particles of resin, secondary reaction products and the like.

Our product is 85% pure alkyl pyridinium chloride. It dissolves into a clear or only slightly cloudy solution with water. It's also soluble in a variety of organic compounds.

There's more about the compound's properties and actions in the data sheet we offer in the coupon.

## New chlorine safety chart

Whether you use chlorine for bleaching or water treatment, you'll find this new Hooker wall chart an excellent addition to your safety program.

In simple language, the chart lists some of the precautions to be observed in handling chlorine and in emptying tank cars, cylinders, and ton containers.

The various valves used on these containers are diagrammed and explained.

There is also a section on what to do in an emergency along with first aid suggestions—all advice that could minimize the effects of an accident should one occur.

The main purpose of the chart is to *prevent* accidents.

Check the coupon for a copy of the wall chart *and* for the latest data sheet on Hooker chlorine.

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2. Calcined regular—granular 99.2% to 99.6%
3. Calcined powder 99.2% to 99.6%
4. Powder—91% to 94%
5. Liquid—47% to 52%

For details on the form that meets your needs best, check the coupon for technical data.

**For more information** on chemicals mentioned on this page, check here:

- ☐ Caustic Soda Engineering and Handling Guide
- ☐ Caustic Soda, liquid
- ☐ Caustic Soda, flake
- ☐ Lauryl Pyridinium Chloride
- ☐ Chlorine Safety Chart
- ☐ Chlorine
- ☐ Carbonate of Potash

**For information** on these other Hooker chemicals used in the textile industry, check the box:

☐ Oxalic Acid ☐ Sodium Sulfide ☐ Sodium Sulfhydrate

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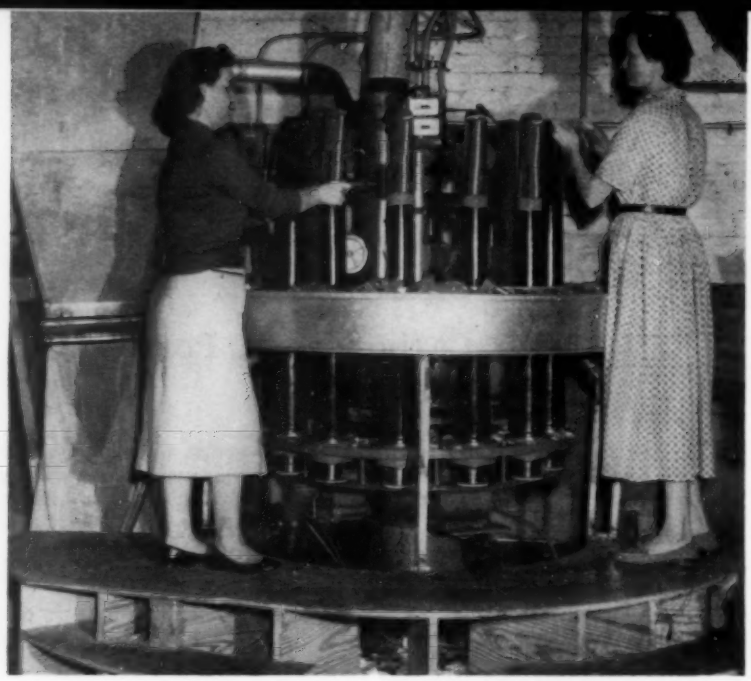


TRIMMING MACHINE has speeded production to 800 doz. pairs of socks per day. Socks are drawn on these rotating forms, and the loose ends are trimmed and drawn away.

# Weekly Schedules Speed SOCK PRODUCTION

**By making out weekly production schedules for each department and keeping closely to the schedules, this Georgia hosiery mill—**

- **Keeps inventories down**
- **Keeps all machines running**
- **Supplies quick deliveries**

A PRODUCTION CONTROL SYSTEM at Maryon Hosiery Mill, Inc., Carrollton, Ga., speeds goods through the plant, keeps inventories low, keeps all machines busy, and supplies quick deliveries. Most orders leave the mill a week after the order has started knitting.

A large variety of styles is made at Maryon. Boys' and men's hosiery in cotton and blends are made in different wrap and striped patterns, but weekly schedules keep the goods flowing smoothly through all operations.

These weekly schedules are supervised by Maryon's president, T. F. Hirsch. These schedules are based on timestudies made on each style of sock. Master schedules are made for the knitting and dyeing sections each week, and similar schedules are made for looping, boarding, and labeling at at the same time.

When an order is received, materials such as yarn, boxes, and labels are immediately checked and ordered. The orders are then split into styles and placed on a production board according to their style.

### Weekly Schedules Are Made

Schedules are made out each week from this board. The orders are broken down into the component sizes, styles, and colors; and the master knitting schedule is prepared.

Each style is timestudied to determine the number of minutes each dozen takes to knit. From these figures, the number of dozens knitted per day is calculated and the time required to knit the order is worked out with a slide rule.

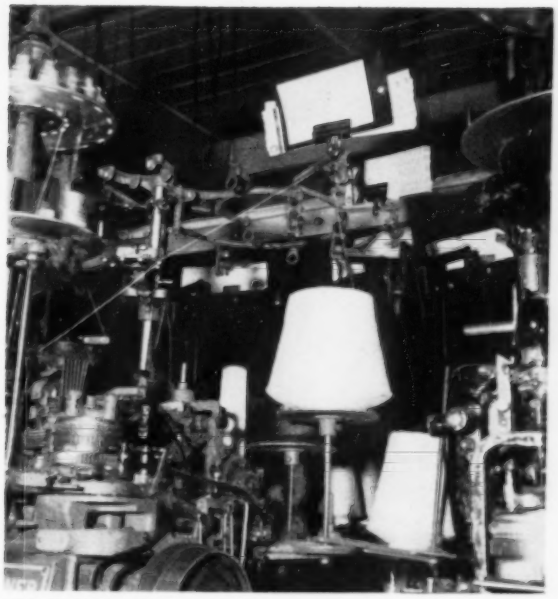
Each style column on the knitting schedule shows the number of machines knitting that style. The day the order should be completed is marked on the schedule.

To keep orders balanced, the machines are checked when the order is nearing completion. If the schedule has been upset by some unpredicted happening, such as a faulty machine, the machine setup may be changed so that all machines on that style run out together.

### Tickets Are Machine Printed

A Dennison machine is used to print production tickets. These tickets show the style, size, and color of the lot; and they are perforated at sections so the various operators can tear off a stub for payroll figures.

There are 50 knitting machines that make plain and striped socks and 52 wrap-reverse machines. Boys' socks from Sizes 7 to 10½ and men's socks from Sizes 10 to 13 are knitted.



KNITTING TICKETS are clipped to the yarn rack along with the style form that shows the yarn and color combinations. The order to follow is placed on the rear yarn rack.

RACKS down the side of each knitting aisle hold spare yarn and socks. Completed lots are placed in bags for the next operation. Each machine is allotted its own rack.

Because of the many different yarns and colors that are run, socks are checked for size after each color change. Sizing screws on the machines have been tipped with tungsten; so they don't wear out so quickly and keep machines out of production.

To prevent mistakes in knitting, each machine has a visual style-form holder. These forms, which show the color combinations of the style, the yarn details, and the construction details, are slipped behind the transparent plastic cover of the holder. The form is clipped to a holder on the yarn rack.

### Style Forms Prevent Mistakes

A master style form is made out when the style is established, and this form is posted on a red card. A master sock sample is stapled to this form.

The knitting tickets for work to be done are also clipped on the yarn rack. Orders that require a change are clipped to the rear yarn rack. When present orders have been worked out, these tickets are moved to the front rack. The original ticket is moved to the front of the machine to signal the fixer for preparation of a machine change.

Racks behind the knitting machines are divided into compartments, and each machine has its own rack. The top shelf is used for yarn and socks, and the lower shelf is used for bagged goods.

Each knitter looks after 20 to 22 machines; and he replenishes the yarn shelf, if necessary, before he takes over his machines. Socks are separated, turned, and inspected on the top shelf, which also serves as a table.

The knitter places these socks at the right of the shelf. When he can take time from other duties, he counts these socks in ½ doz. pairs and places them in the center of the shelf.

### Lots Go Through Complete

He tears off the first ticket stub and puts the socks in a bag. If only part of the order is completed, he puts the number he has knitted on the ticket for the information of the following shift so that lots go through the mill complete.

Bags of socks are delivered to the end of the aisle, where the bags are continuously picked up and delivered to the looping section. Most socks are looped outside the mill. A truck delivers the socks one morning and picks them up the next morning.

Looper production is checked on the schedule in the looping department. One day is allowed for each lot to leave the looping section after it has been knitted. If production gets unbalanced, the floor helper checks the schedule and distributes goods required that day to loopers in the mill.

Clipping has been speeded with the installation of a trimming machine. This machine has two operators who use the machine to clip the loose ends from 800 doz. pairs of socks each day. Six girls used to do this job.

### How Socks Are Trimmed

Socks are drawn on rotating hollow forms, and a blade and suction device trims off the threads and draws them away to a waste box. The socks are then drawn through the hollow form and deposited in a trough to be dropped in a bag.

A platform made from plywood has been built around the trimmer, and a semicircular trough is kept full of socks to be trimmed. To increase the efficiency of the machine, the drive belt has been replaced with a neoprene belt and the clutch has been removed so the head always revolves.

The socks drop from the trough into a bag. If the socks are for wetting out only, they are put straight into the dye bag.

No gray stock is kept. Socks to be dyed are immediately moved to the dyehouse and sorted out in bins according to the required color.

### Dyehouse Works to Schedule

A dyehouse schedule, made out at the same time as the master schedule, shows the daily dyeing requirements. The styles are broken down, and the previous week's balance is brought forward and entered on the sheet along with the week's knitting requirements.

Figures are entered on the sched-

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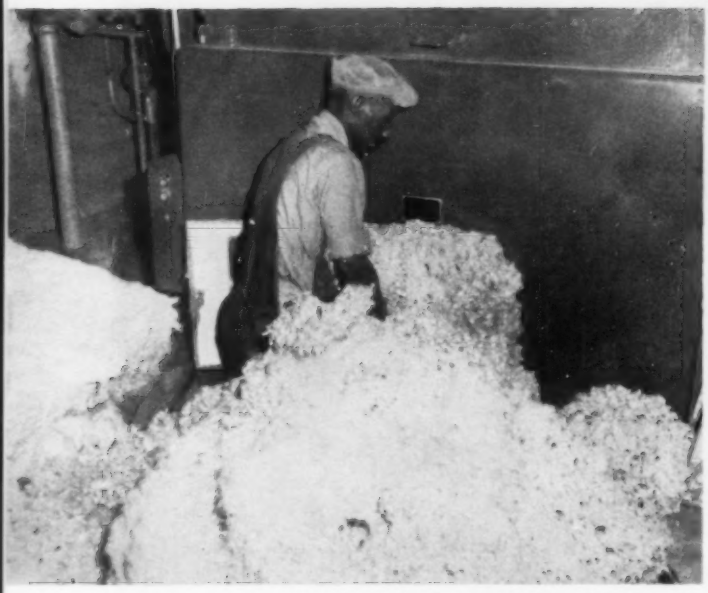
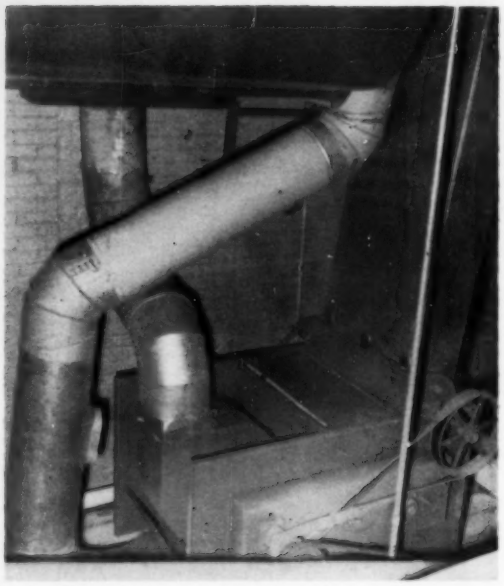


TRASH AND MOTES removed are 0.75% greater than the amount removed by the original line.



FIRST CLEANER feeds into a No. 12 condenser, which in turn delivers the stock to an SRRL cleaner.

# *Unusual CLEANING LINE*

## *Cuts Cost at Gold-Tex Fabric Corp.*

By rearranging opening-room machinery and adding one cleaner, Gold-Tex Fabric Corp., Rock Hill, S. C., has—

- Increased rate of production
- Increased yarn-break factor
- Increased the amount of trash and motes removed

**By GEORGE B. PEELER,** Superintendent, Gold-Tex Fabric Corp.

GOLD-TEX FABRIC CORP., Rock Hill, S. C., has worked out a radically new cleaning line that will permit lower-grade cotton to be used successfully if the higher grades become unavailable.

The new machinery layout makes it possible to run cotton one grade lower than the grade formerly used; yet yarn and cloth are equal to or better in strength and quality than similar products made from the higher-grade cotton.

After Gold-Tex was modernized in 1955, the opening-room equipment included one waste hopper for reworkable waste and five feeder hoppers. All the hoppers fed onto a feed table that supplied four Junior cleaners in tandem.

The stock from the cleaners went into an SRRL cleaner, a condenser, and a downstroke beater. From the beater, the stock was pulled by a No. 12 condenser into the picker room, where it was dropped on a rake distributor and fed to the pickers.

### Production Was 1,400 Lbs. per Hr.

Approximately 1,400 lbs. of stock per hour was processed through this line, and the equipment handled this amount very well.

The quantity of leaf, fly, and broken fibers left in the stock through spinning was not excessive. Nep count for denim was acceptable.

Denim made by Gold-Tex with stock from this cleaning line received a very good reception in the market. But when the denim market began to fall, the management realized that the time would come when it might be necessary to process more efficiently to meet competition.

With this fact in mind, the mill began to experiment

with different machinery arrangements and types of equipment.

### Equipment Was Rearranged

The original opening equipment was rearranged, and the Junior cleaners were put between the feeder hoppers and the feed table. This setup let the feed table empty into the SRRL machine; then the stock passed through a condenser to the downstroke beater and into a No. 12 condenser and the rake distributor.

The result of this rearrangement was satisfactory as long as the original grade and staple of cotton were used. There was no appreciable difference in the appearance and breaking strength of the yarn.

After the tests were completed, experiments with a blend of 50% one-grade-lower cotton and 50% original-grade cotton were begun. After considerable testing and checking, we decided that the rearranged line would not give the desired quality with lower-grade cotton.

Next, we decided to try an Axi-Flo cleaner, which was installed in the opening line in place of the SRRL machine and the downstroke beater. Stock was made from the same-grade cotton and staple, and the yarn break factor was checked for 60 days and compared with the same kind of yarn made from stock processed through the opening line before the changes were made.

The break factor jumped 209 points with the installation of the Axi-Flo and the removal of the downstroke beater. This rise in break factor took place in yarn made from the same grade and staple of cotton as was used before the new machine was installed. The appearance of the yarn was much cleaner from the standpoint of leaf and trash, and no increase in neps was noted.

Before the line was rearranged, a supply of yarn was set aside for comparison and to be used as a control. This yarn was made from the regular grade and staple of cotton put through the original opening equipment.

### Grade Was Lowered Experimentally

At the end of a 60-day period, experiments were begun in using a blend of 50% lower-grade cotton and 50% original-grade cotton. When yarn from this mix was made and checked for breaking strength, the break factor was 25 points lower than for yarn made from the original mix. But even with this decrease, the yarn was exceedingly strong for the end product.

When the yarn made from lower-grade cotton was checked for leaf, trash, neps, and general appearance, there was no appreciable difference between it and the control yarn. If anything, the yarn coming from the new opening line was of better quality than the yarn from the original equipment.

No bad defects were noted in the fabric after approximately 25,000 yds. of cloth were inspected. Consequently, the management decided to run additional tests on the 50% lower-grade and 50% original-grade cotton.

In addition to the tests made at the plant, tests also were made by three independent laboratories. The breaking strength and the quality of the fabric that was being produced from all the yarns under test were checked. After these independent tests were completed, the decision was made to experiment more with the opening equipment.

### Questions Arose

After a consultation with the machinery manufacturer, two Axi-Flo cleaners were installed in tandem and one No. 12 condenser was added. At the time this decision was made, everyone concerned had questions in their minds as to whether the installation would be a success and what would happen to quality.

The second Axi-Flo was installed in front of the SRRL machine so that the stock was delivered from the feed table to the first Axi-Flo and then to the No. 12 condenser, which in turn delivered the stock to the SRRL machine. Then the stock passed through another condenser to the second Axi-Flo and on to the No. 12 condenser in the picker room, where it was dropped on the rake distributor.

After this installation was completed, the plant continued to experiment with the lower- and the original-grade blend. There was no drop in break factor. The appearance of the yarn was equal to that of the control yarn. After checking the fabric for a period of four weeks from all angles, the appearance, break, and general quality were equal to or better than the original control fabric.

The amount of motes, leaf, and trash that came from the second Axi-Flo machine showed an increase of 0.5% over the amount of waste produced by the downstroke cleaner. The motes are removed every 4 hrs.; the type and amount of motes removed from the second machine are shown in one of the accompanying photographs.

### Grade Again Was Lowered

Gold-Tex then decided to try a mix of 100% one-grade-lower cotton. Twenty-five bales were processed through the opening line with the two Axi-Flo cleaners in tandem. At each process along the line the stock was observed very closely, and no bad effects were noted.

When the yarn was spun, the break factor was checked against the control factor and found to be well above the original break factor of the control yarn. Upon checking the yarn for quality against the control yarn, it was found to be equal to or above that of the control yarn from the standpoint of neps, trash, leaf, and general appearance.

The stock was followed closely through every process until the fabric was baled in the cloth room. The appearance of the experimental fabric was equal to that of the

CONTINUED ON PAGE 182

## You May Have To Lower Your Cotton Grade

"Because of the rain-damaged 1957 cotton and decreasing supplies of the better grades in the carryover, many mills this year may be forced to run lower-grade cotton than they normally use. Already, good cotton is becoming scarce, specified grades are hard to obtain, and prices are advancing. There is a plentiful supply of the lower grades, but very little Middling or better is available.

"The present trend in opening, as everyone knows, is toward fewer machines in the cleaning line. There is a good reason for this trend because less beating produces fewer neps and broken fibers and less fly. Processing is easier throughout the plant, and cotton processed on short cleaning lines usually gives a higher breaking strength in yarn and fabrics.

### Re-evaluate Cleaning Lines

"Short cleaning lines are fine where cotton quality is good and the price is not excessive. However, when the pinch comes—as is the case now—it may be well to re-evaluate your cleaning setup and see what you can do about running lower-grade cotton without lowering the quality of your end product.

"We at Gold-Tex Fabric Corp. have done a lot of work in this direction and hope that our experience may be of some value to other manufacturers."

—George B. Peeler

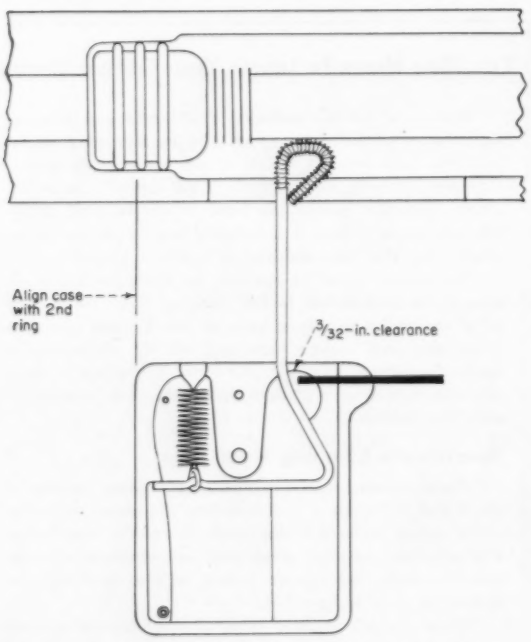
# How To Set FILLING FEELERS To Make More and Better Cloth

- Filling feelers of the midget type need little maintenance if they are set right and left alone. But some parts of the feeler can be altered without tools, and unauthorized persons often make adjustments.

- Here's how the feelers should be set and maintained—

By **WILMER C. WESTBROOK,** Assistant Editor, TEXTILE WORLD

THE MIDGET FILLING FEELER is a very simple and efficient loom part. But its very simplicity and open construction often cause trouble. Weavers and other unauthorized persons are constantly bending the feeler blade or connecting wire. They also use a quill or other object to strike the feeler case and move it on the stand.




FEELER CASE should be aligned so that tip of blade touches bobbin when lay is 5/16 in. back of front center and moving forward.

When correctly installed and adjusted, the midget feeler will give many days of trouble-free service. It will reliably indicate thousands of filling changes, but the feeler is often blamed for things over which it has no control.

The feeler is adjusted with the shuttle correctly positioned in the left-hand box. Therefore if the shuttle is not positioned correctly on each pick when the loom is running, the feeler is not adjusted to it and malfunction will result. If connecting parts are worn or improperly set, the feeler cannot be held at fault.

### The Feeler Gets the Blame

But most weavers and many loomfixers immediately blame the feeler when a filling change is not consummated or when partly emptied quills are ejected from the shuttle.

Too many times the weaver will not flag the loom but will attempt to make adjustments to the feeler himself. He will bend the feeler blade first one way and then another. The connecting wire will be alternately shortened and lengthened. He will hammer at the feeler case to move it forward and back, from left to right.

Of course all these adjustments are made by guesswork. The trial-and-error method of experimentation is used. Usually the weaver flags the loom for the fixer when he fails to get results.

But too often the loomfixer himself does not understand the feeler and uses trial-and-error methods. He may eventually get the feeler performing satisfactorily but usually by discarding some perfectly good parts. Such loomfixers will throw away a loom part if it has the paint worn off of its contact point.

### Many Things Prevent Transfers

Many times the feeler will not be at fault and much time will be wasted working on it before other loom parts are checked. A worn pick point at the opposite end of the loom will often cause the feeler to miss a transfer. An

open box or a worn checkstrap will let the shuttle bounce and prevent the feeler from operating. A loose or worn-out rocker-shaft bearing will let the lay rise and keep the feeler blade from entering the slot in the shuttle correctly.

Instead of fixing the part at fault, the loomfixer will often make an abnormal setting of the feeler or its parts to compensate for the abnormal action of the shuttle.

It is really very easy to set the midget feeler and its connecting parts correctly, and the correct setting has many advantages.

### It Pays To Set Feelers Right

1. If the feeler is set right and filling is still not being changed correctly, the loomfixer knows that he must look elsewhere for the trouble.

2. Correctly set parts do not break or wear out as quickly as those that are not set in true relation to other parts.

3. By using standard settings, each loomfixer can tell quickly when the feeler is out of adjustment and the fixers on each shift will not be undoing the work done on the preceding shift.

4. When the feeler is correctly set, the loom will run longer without attention. Costs, waste, and seconds will be reduced; production will be increased.

To check the positioning of the feeler case, take a pencil or other straight object and place it along the outside edge of the case. The edge of the case should be in line with the middle ring of the bobbin, the shuttle being fully boxed.

### Set the Feeler This Way

For cotton filling, move the lay forward until it is $\frac{7}{32}$ in. before front center. Adjust the filling case so that the feeler blade touches the empty quill in the shuttle and is slightly above the center of the quill.

When the lay is pulled to front center, the feeler blade should slide along the quill but a clearance of at least $\frac{1}{32}$ in. should be between the blade and the side of the slot in the feeler case. The connecting wire should be adjusted to have a $\frac{1}{32}$-in. clearance between it and the feeler blade with the blade in its relaxed position.

With the filling cam in its low position, there should be a $\frac{1}{8}$-in. clearance, both vertically and horizontaily, between the filling motion trip and the liftng lever. Feeler settings for rayon looms are closer than those for cotton. All clearances should be reduced about one-half.

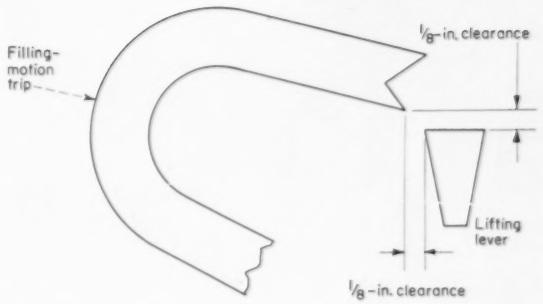
Weavers and loomfixers, and even second hands, will often bend the feeler blade up, down, or sideways instead of moving the case. The blade is sometimes bent to contact the quill at an unorthodox angle to offset some fault of other loom parts.

### Don't Bend the Feeler Blade

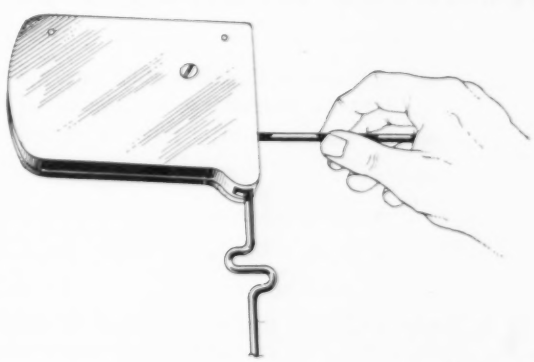
A broken or cut-off spring is sometimes used on the blade to hold it tighter, and the feeler case is often filled with oil. These practices cause trouble sooner or later. The feeler blade is made in the right shape and should not be changed. It should not be forced to operate but should move in the case freely.

A single drop of oil on the feeler blade where it contacts the side of the case is enough. Or better still, remove the cover about once a month and swab the inside of the case with an oily rag.

The midget feeler is a small item, but its abuse or neglect can cause a lot of trouble. If everyone in the weave room, from the weaver to the overseer, understands this important loom part, much of the trouble can be prevented. Only by correct setting and maintenance can the feeler be expected to perform efficiently.

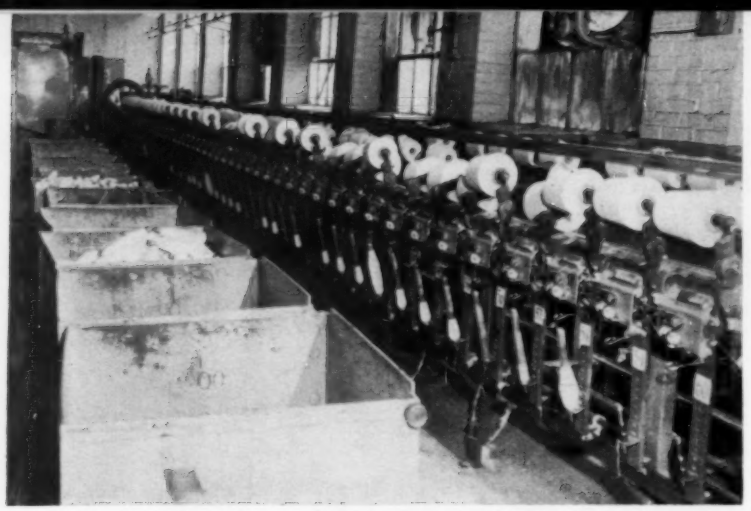



LIFTING-LEVER and filling-motion-trip settings are made with the filling cam in its low position.



FEELER-BLADE SHAPE should not be altered. Loomfixers and weavers sometimes bend the blade.

CONNECTING ROD is another part that can be altered without tools. Weavers should leave it alone.



WARP WINDER has variable-speed drive and operates at a drum speed of 1,820 ft. per min. at the head end and 1,808 ft. per min. at the foot.

# Constant Care in WINDING Reduces Broken Yarn Ends

**All yarn at Carolina Mills, Inc., Mill No. 3, Newton, N. C., is used to weave Canton flannel. A maintenance man checks yarn winders and quillers constantly, and regular laboratory checks show the effectiveness of the maintenance. Over-all end reties are—**

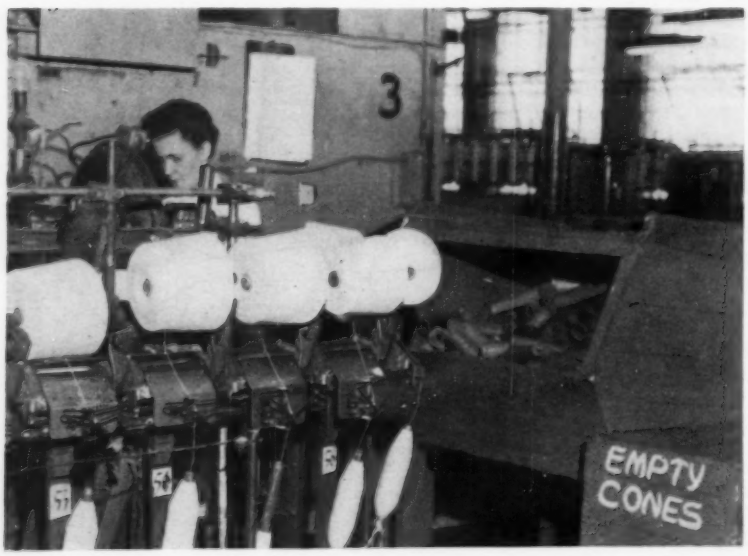
- **Warp winders on 18.5s yarn—12.8%**
- **Filling winders on 5.40s yarn—6.4%**

ALL YARN-WINDING MACHINERY at Carolina's Mill No. 3 is Abbott equipment. There are four yarn winders, one for warps and three for filling. Four quillers are used, and all filling is rewound.

The warp and filling winders are Models 64 and 65. The machine used as a warp winder has 198 units and has a variable-speed drive. The head end operates at 1,820 drum ft. per min., and the foot end runs at 1,808 drum ft. per min.

Units are run on 12.5s and 18.5s yarn interchangeably on the machine at the same time. In 12.5s yarn, the machine drops 24 cones per minute; and on 18.5s yarn, it drops 21 to 22 cones per minute. The average weight of the cones is 4 lbs.

The over-all reties on a typical lab-




FILLING WINDER winds from 7 oz. of yarn on the bobbins to 4-lb. cones. Each unit of the winder has a colored number for complete maintenance records.

BOBBIN BIN for the warp winder receives bobbins from the box with casters. An electric hoist stops the box at any position during lifting.

oratory check utilizing the Wernertex mill control system in 18.5s yarn are 12.8%. Broken down, the breaks are:

End breaks, 4.9%
Slubs, 4.4%
Failure to tie, 0.7%
Empty spindles, 0.3%
Sloughed or tangled, 1.5%
Tailings on run-outs, 1.0%

For filling winding, there are three machines. One machine is a 99-unit variable-speed-drive winder. One is a 75-head winder. The third machine has 70 heads and is used only on special coarse yarns.

The 99-unit winder drum operates at 1,385 ft. per min. at the head and 1,490 ft. per min. at the foot. Cones produced per minute are 17 to 21 on 4s to 8.75s yarn.

### Filling Reties Are Low

Over-all breaks on an average laboratory check on the 99-unit winder on 5.40s yarn are 6.4. Broken down, the breaks are:

End breaks, 3.0%
Slubs, 1.0%
Failure to tie, 0.4%
Empty spindles, 2.6%
Sloughed or tangled, 1.0%
Tailings on run-outs, 1.4%

A laboratory check of the 75-head filling winder shows 9.7% over-all reties. Individual stops are:

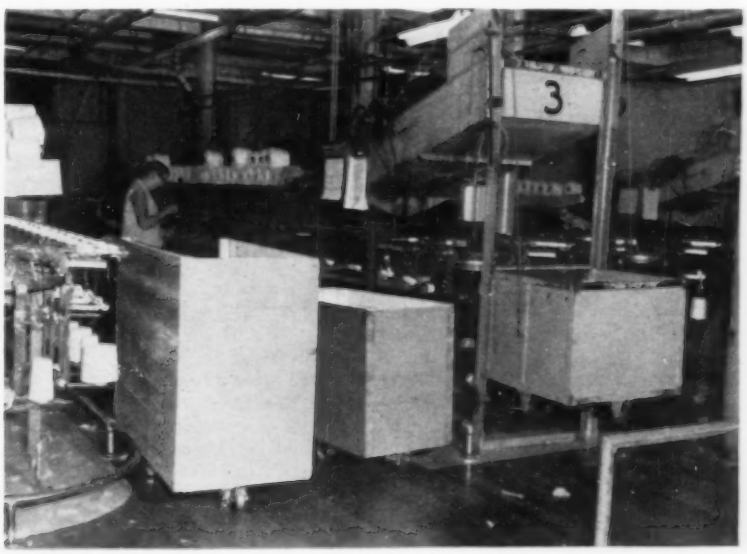
End breaks, 2.9%
Slubs, 1.0%
Failure to tie, 0.0%
Empty spindles, 2.1%
Sloughed or tangled, 1.0%
Tailings on run-outs, 2.1%

### Quiller Production Is High

The four quillers have the following number of units each: one has 50, one has 60, and two have 70. Bobbins doffed are (1) 50-head quiller, 2.65s to 3.30s yarn, 27 bobbins per minute; (2) 60-head quiller, 3.65s to 4s yarn, 27 bobbins per minute; and (3) 70-head quillers, 2.65s to 3.30s yarn, 27 bobbins per minute. Bobbins average 2.3 oz.

Constant maintenance of winders and quillers keeps yarn quality high and reties low. Each unit of each machine is numbered, and the colors of the numbers of each machine are different.

A maintenance chart is set up with the numbers of each machine listed. When the maintenance man overhauls and cleans a unit, he checks the date on the chart. Then he refers to the chart when a unit needs additional work later. But because overhauling and cleaning is so thorough, little operating maintenance is necessary.




QUILLERS wind the cones from the filling winders to 8¾-in. loom bobbins. A 50-unit quiller doffs 27 2.3-oz. bobbins per minute on 2.65s to 3.30s yarn.

RASCHEL MACHINES are now used extensively to produce fabrics that closely resemble materials made on lace machines. Modern machines are equipped with up to 18 guide bars. Tension on the beams and individual threads is an important factor in knitting fault-free fabrics.

# *Pointers on Knitting* RASCHEL LACE

**Many designs are being knitted an raschel machines that are competing with true lace materials. These fabrics are made with up to 18 guide bars. Among the points to watch when you knit these fabrics are—**

- **Tension on the yarn**
- **Reed positions**
- **Choices of yarn**

**By LEOPOLD E. LICHT**

HIGHER SPEEDS AND MORE GUIDE BARS have accelerated the knitting of imitation lace and lace edgings on raschel machines. These machines are now built with up to 18 guide bars to produce fabrics that closely resemble materials made on lace machines.

Most machines used today are 36-gauge machines. There are several methods of setting up these machines, and some of the advantages and disadvantages of these methods are outlined here.

Raschel machines used to knit lace and edgings are partly controlled by tensions obtained from the tension wires and springs on either side of the tension wire.

Another important factor is the weights that control the tension of the yarn being delivered to the knitting elements.

The most up-to-date machines have

up to three automatic let-offs that are used for the main and the chain beams. The spot beams are still controlled by a rope suspended over a pulley firmly attached to the beams. A weight hangs from the end of the rope.

### Adjust Rope Correctly

The heavier the weights on the rope, the more tension is applied to the beam. The rope must, however, be pulled against the beam. If the beam rotates clockwise, the weight must be suspended in a counterclockwise direction.

To avoid cut reeds, which cause end breaks when a knot travels through the reed, check the relationship between the tensions of the various beams. Start the check with the front beam or beams that produce the ground fabric.

When the tension has been adjusted to produce a good ground, adjust the tension on the chain beams and the spot beams, and bring in the tension to the ground. Check for tight and loose places in the design at this point.

When a spot beam lays over two or three needles, the tightness will show. This tightness might be caused by an unbalanced beam or excessive weight on the beam.

An unbalanced beam or too little weight will cause a loose spot in the design when the spot beam lays over four or more needles.

### How Ground Is Knitted

The ground fabric of raschel lace or lace edging is produced with one, two, three, or four guide bars, although more guide bars can be used. In knitting the ground fabric, the knitting bar is usually No. 1 bar, and the bar that lays is the last bar.

On multibar machines, a setup might be found where the laying bar for the ground is No. 3 on the machine. This setup has its disadvantages because No. 1 and No. 2 bars must be cut out and raised to rethread No. 3 bar.

This setup, however, permits easy access to the patterning guides, because the back of the machine is open compared with the setup where a fully threaded guide bar is positioned as the last guide bar on the machine.

Latest machines have an upper diversion assembly that permits all the beams to be separated before they pass over their respective tension wires. Before an end passes through the guide bar and enters the knitting elements, it is usually threaded through a reed to insure that the end is kept separate from other ends.

### Higher Reed Is Useful

This reed is generally mounted on the guide bar, but front-beam reeds are sometimes moved from this position and mounted close to the upper diversion assembly. This setup is useful when a smash occurs.

The reed is positioned several inches from the guides, and this position allows the ends to remain in their position in the reed although many ends might break out from the guides at once.

Yarn used for the ground fabric is usually 40-den. semidull nylon, the chain or pillar is 70-den. nylon, and the pull thread of an edging is 210-den. nylon. The picot is usually made of two ends of 140-den. nylon, and the gimp is two ends of 150-den. acetate. The liner is two ends of 150-den. acetate, one end of 240-den. acetate, or two ends of 200-den. acetate.

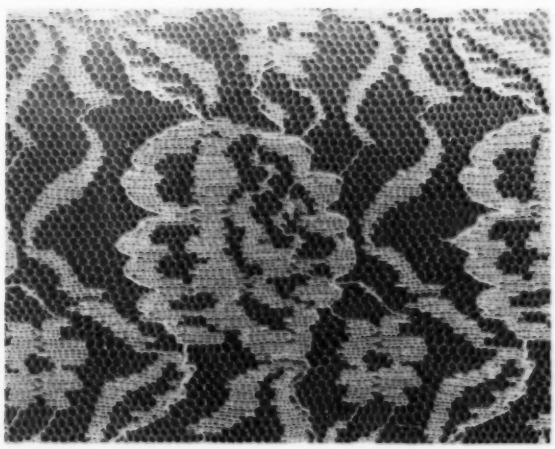
| 1st Ground | | 2nd Ground | | 3rd Ground |
|---|---|---|---|---|
| Bar 1 | Bar 2 | Bar 1 | Bar 2 | Bar 1 |
| 2–0 | 0–0 | 2–0 | 0–0 | 2–0 |
| 0–2 | 2–2 | 0–2 | 2–2 | 2–4 |
| 2–0 | 0–0 | 2–0 | 0–0 | 2–0 |
| 2–4 | 4–4 | 2–4 | 4–4 | 2–4 |
| 4–2 | 2–2 | 4–2 | 2–2 | 2–0 |
| 2–4 | 4–4 | 4–6 | 6–6 | 2–4 |
| | | 6–4 | 4–4 | |
| | | 4–6 | 6–6 | |
| | | 4–2 | 2–2 | |
| | | 2–4 | 4–4 | |

GROUND FABRICS can be made with one, two, three, four, or more bars. Most grounds have one of these three setups.

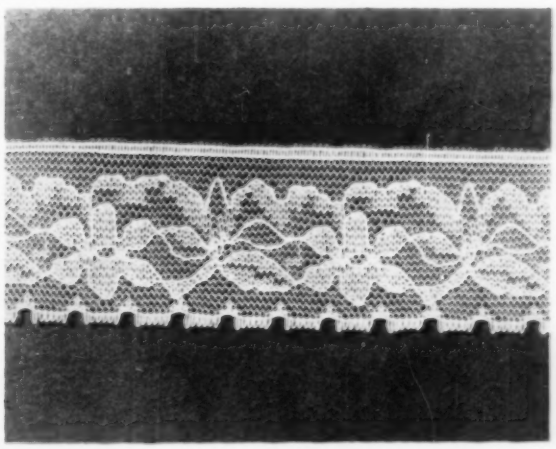
The yarn denier depends on the yield of the fabric required. Provided the design shows up well and the correct yield is obtained, any combination of the above-mentioned yarns can be used for the gimp and the liner.

The most important point to watch when lace strips are knitted is the separating yarn. If the yarn has too many broken filaments, if the beam is run under too much tension, if the machine is running too fast for the setup, or if the timing is wrong, the strips will be difficult to separate.

Checking the separating or draw thread every 24 hrs. will allow changes in speed or tension to be made in time and prevent the return of the web because of difficulties in separating.



TEN GUIDE BARS were used to knit this all-over lace design on 42 needles. The ground is 40-den. nylon, the gimp is 240-den. acetate, and the liner is two ends of 200-den. acetate.



LACE EDGING is made on 24 needles with 12 guide bars. The ground is 40-den. nylon, the chain is 70-den. nylon, the pull thread is 210-den. nylon, and the liner is 300-den. acetate.

# Handcuffed by Worn Rings?

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# The Young Supervisor Must Learn Fast

- When a young man takes his first supervisory job, he breaks through into an entirely different level of relations with the people who surround him at work
- His success and progress will depend on how quickly he establishes himself in the minds of his associates as a person they want to work for

By **ROBERT W. PINAULT,** Assistant Editor, TEXTILE WORLD

A young man who has just been made a supervisor is at perhaps the most critical stage of his career. Regardless of how high he later climbs the ladder to more-responsible positions, his first supervisory job can be compared to crashing through the sound barrier in a modern plane. We are familiar with descriptions of what that is like—it's rough.

But once fairly launched, supervision and faster-than-sound flight can again be compared, in some cases. To the well-designed, well-made, and properly controlled plane, cracking the sound barrier is not too bad. To the young supervisor faced for the first time with problems of people, production, quality, and costs, the transition to supervisory levels can be very rough. But if he gets started swiftly in the right direction, his flight can be relatively smooth.

### Brains vs. Sense

We speak of people as being "brainy" or as having "good common sense." These terms are not scientific, but they mean a lot and apply to very different human capacities.

Quite often educated people who are brainy make poor supervisors, while those who have little education but have good common sense make excellent supervisors.

And brainy people who also have good common sense seldom stay for long at the foreman level of supervision.

What does all this mean to the young supervisor? Simply this: that the sooner he finds out what makes people tick, the smoother his path will be and the more rapid his rise.

More than likely, the young supervisor today is college-trained in his field. The mechanics, physics, and chemistry of his job have been pretty well drilled into him. And if he was fortunate, he also attended courses in psychology, human relations, and industrial management.

But one thing he will have to learn fast or cracking the barrier into the supervisory level of flight will be mighty rough, and that is:

Production, costs, and quality are dependent upon people; money, machines, and materials are helpless without men because men implement, actuate, and combine these components into a marketable product.

### Getting the Extra Dividend

This area of personnel relations is where the new supervisor often runs into trouble. The employees may grant his capabilities, may not actively dislike him, seldom sulk or appear to hold back on their jobs; but until they accept the supervisor as their leader, the department will not function as efficiently as it should.

There is a terrific difference in the performances of an employee who is well lead and of one who is not. The first man gives you his time, his efforts, and the extra dividend of his good will and interest. The other gives you his time and only as much effort as is necessary to keep his job up.

This factor of employee interest—what he contributes to the job over and above what he has to do to maintain it—is priceless. The supervisor can't buy it; no wage raise will bring it forth. Plant-scale personnel benefits, picnics, paid vacations, insurance, sick benefits—any of the multitude of fringe benefits—will not insure it at the foreman level.

At that critical level, where the every-day contact of the supervisor spells management to the employee, the supervisor who has a genuine feeling for people will bring forth the best in his workers. That supervisor will get the extra dividend of interest.

### How To Get Cooperation

The young supervisor who wants that sort of cooperation (and every one needs it) will keep in mind all day, every day, a few pointers:

He will be fair.

He will expect no one to do what he is not willing to do.

He will know his employees as people, not just as button pushers, and will know what approach to use to bring forth the best sustained effort of each one.

He will know his job; that means he can operate any job under his jurisdiction, as well as head up the department.

CONTINUED ON PAGE 186

THIS IS NO. 127 OF A SERIES ON

# GETTING THE MOST FROM TWISTING

Information about twisting designed to show improvements in twisting equipment and new ideas in the twisting operation.

## HOW TO KEEP YOUR LEESONA® MACHINES IN TOP CONDITION

The care and upkeep of your twisting equipment are of utmost importance. The time and effort you invest in preventive maintenance pay off in better quality and production. Often the savings you realize by preventing down time from unforeseen stoppages warrant a regular, preventive maintenance program.

Correct maintenance tools are essential to a good preventive maintenance program. Universal has made special tools for its machinery, to help you in your maintenance program. Some of these tools have been described and illustrated in past issues of "Getting the Most from Twisting," but we feel that the subject of the right tools to do the job is important enough to call them to your attention again.

Illustrated on this page are some of the tools used on the Model 10 Ring Twister. There is a complete list of tools for any Leesona winding or twisting machine at the machine's parts sales department. The tools and gauges shown here are:

**Oil Can**

Adequate and regular lubrication of your machinery is vitally important. This oil can (A) can be equipped with an adapter and a hypodermic needle for lubricating the feed rolls on the Model 10 Ring Twister.

**Wrenches**

Wrench (B) is a special wrench for the swing stand nut. Wrench (C) tightens the spindle step nut. Wrench (D) is a specially-designed wrench for adjusting the spindle swing's tension on late Model 10 Ring Twisters.

**Ring Gauges**

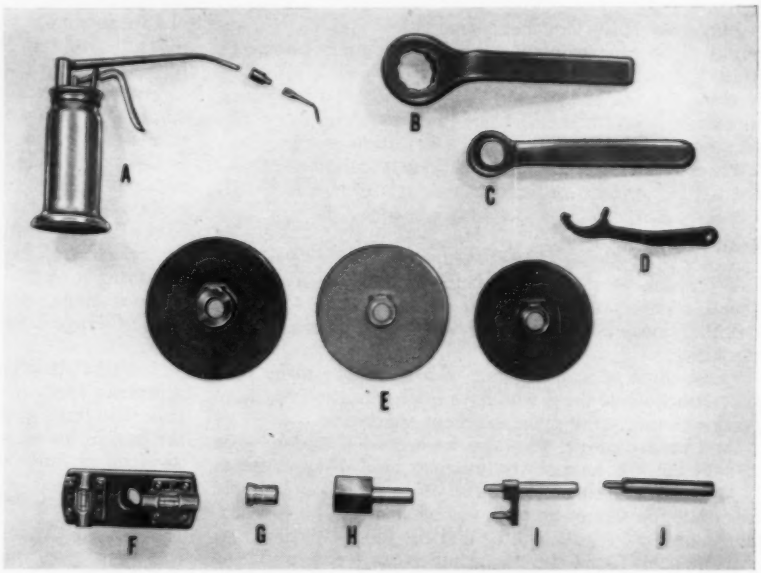
These gauges (E) are used for centering the rings. The gauges illustrated are $4\frac{3}{4}''$, $4\frac{1}{2}''$ and $4''$ rings. Other gauges are available for $5''$ and $4\frac{1}{4}''$ rings.

**Spindle Leveling Gauge**

Gauge (F) is used to level spindles or idlers. The two bubbles set at right angles to one another allow the spindle and idler to be leveled crosswise and lengthwise at the same time. Adapter (G) is used to level $\frac{1}{2}''$ diameter straight blade spindle. Other adapters not shown are also available for different spindle blades. Plug (H) is used when leveling idlers.

**Ring Rail Centering Tools**

These tools (I) and (J) are used only for new Model 10 Ring Twisters, when these machines are being erected or when they are being moved and must be reassembled. These gauges locate the ring rails and lifter rods, thus preventing them from binding.




March 1958 — 23.7.11

*Winding and Twisting Machinery for Natural and Synthetic Yarns*

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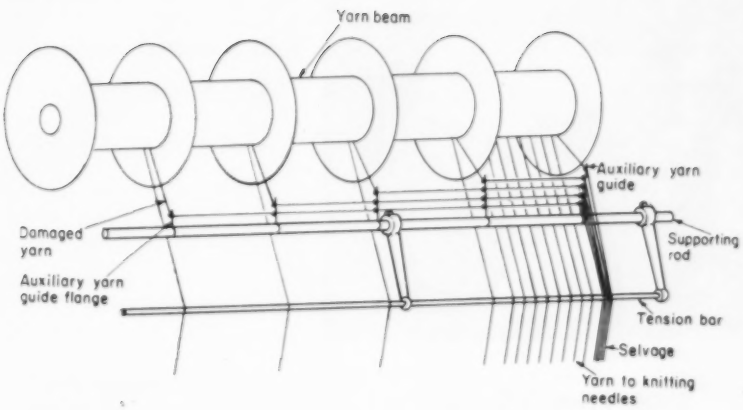
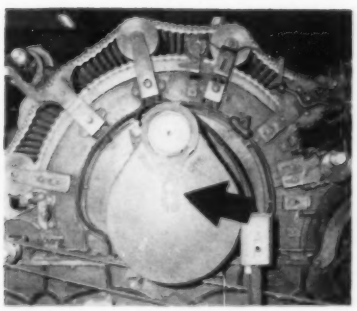



## Tricot Yarn Guides Reduce Damaged Ends

We are sometimes troubled with damaged yarns at the beam flanges of our tricot machines. These damaged yarns are guided to the outside needles and knitted at the selvages.

When more than one spool had damaged threads, the yarn sometimes would get twisted; so we made simple wire guides to keep the yarns separate. The guides are made from bent wire and are clamped to the supporting rod of the tension bar.

If five spools have damaged threads, five auxiliary yarn guides are clamped to the supporting rod to lead the five threads to the selvage. (K-3757) *Hokao, Fukaya, Fukui-ken, Japan.*



## Guard on Guard Prevents Carding Accidents

We use individual drives on our cards that are covered with a guard housing. The pulley at the top of the drive protrudes several inches, however, and presents something of a hazard.

To prevent accidents to operators who might catch their clothes in the pulley, we built a guard (arrow) as shown in the photograph. And so far, we have had no accidents caused by exposed pulleys. (K-3745)

## Wrong Ends in Cloth Can Be Detected With Ink

When a mill is running several types of yarn, there is always the possibility of getting some ends of the wrong kind of yarn in a warp.

Each yarn has different properties. Cotton absorbs liquid faster than rayon and viscose. Spun and filament man-made-fiber yarns all react differently when liquid dyestuff is applied.

These natural properties of yarns can be used to detect wrong warp ends without excessive waste of time or material. Ordinary writing ink is quick drying and makes an effective tint.

If a cloth with a cotton warp contains some spun viscose, the ink will be immediately absorbed by the cotton; it will run farther along the viscose and form a dark stripe.

Regardless of the type of yarn that becomes mixed in a warp, the ink will expose it by making it darker or lighter than the regular yarn. Sample tests will show how each fiber reacts.

For instance, if a warp composed of 670 nylon (dull) contains an end of 200 nylon (semidull), the end of the 200 nylon will turn almost black when ink is applied; the Type 670 will remain light blue. (K-3698) *P. Mazeika, Montreal, Canada*

## Brush Mounted on Motor Cleans Bobbins Instantly

We used to clean inside the barrels of wooden bobbins with a hand brush. The procedure was tedious and time consuming.

To improve and speed up our bobbin cleaning, we mounted a long, narrow brush on the drive shaft of a small motor.

The dirty bobbins are pushed onto the brush while it is in motion, and they are cleaned almost instantaneously. (K-3784) *Rhyne-Houser Mfg. Co., Cherryville, N. C.*

## $500 Prize Winner

A. J. Redmond of Gastonia, N. C., has received $500 as the 1957 annual prize in TEXTILE WORLD's Kink Contest. His winning Kink, "Machine to Match V-Belts Makes Old Belts Last Longer," appeared in the December, 1957, issue.

Mr. Redmond, overseer of spinning at Parkdale Mills, Inc., Gastonia, N. C., won the $25 monthly prize twice in 1957 and has been a contributor of Kinks for many years.

Born near Gastonia, Mr. Redmond started working as a doffer in the Parkdale spinning room when he was a young man. He has run every job in the department at one time or another. For the last 16 years he has served as overseer.

"I enjoy studying and improving mechanical devices," says Mr. Redmond, "which may account for the number of Kinks I have sent TEXTILE WORLD over the years. I hope to submit more in the future."

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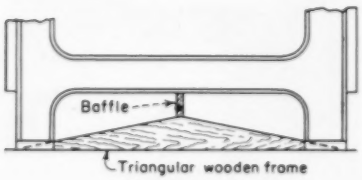



### Triangular Board Keeps Floor Under Frames Clean

Because of the low clearance of our spinning-frame undercarriages, the sweepers frequently failed to remove debris, such as waste, trash, bobbins, skewers, and washers, which accumulated under the frames.

We solved the problem by placing a triangular wooden frame on the floor under the frame so that the junk rolls out into the aisle where the sweepers can see it.

We also found that a piece of board about 4 ins. high attached to the apex of the triangle would stop lint from being blown by air currents across the floor from one frame to another. (K-3421) *Flora Chiu, China*

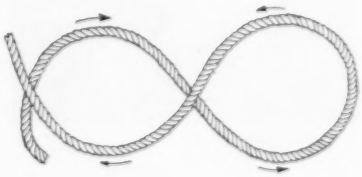
### Heat End of Monofilament To Make Knots Hold

It is hard to make a small, compact knot in monofilament yarn that will hold. But if the end of the yarn is heated, a tiny ball will form on the tip. This ball will prevent the end of the yarn from slipping through any conventional knot.

Once I was weaving samples of some very-fine-denier plastic warp and had a lot of trouble with ends breaking. I got an old automobile cigar lighter and attached it to the loom stop motion. When an end would break, I'd heat the lighter and touch the end of the yarn to fuse a non-shipping ball onto it. (K-3586)

**$5 to $10 for any Kink accepted for publication. Each one will be entered in the $25 and $500 prize-winner contest.**

**Send in your Kink now.**



### Figure-Eight Coil Keeps Rope From Kinking

When cord or rope is coiled, twist will be added or taken away, depending on the direction of the twist and the direction in which the rope is coiled. Kinked and tangled cord and rope often result from the change in twist.

If it is necessary to place cord or rope in coils, the job can be done easily without affecting the twist. Just put the rope in figure-eight coils as shown; and the twist put in one coil will be counteracted by the twist taken out of the other coil. (K-3482) *Chas. S. Bicksler, Lancaster, Pa.*

## January Prize-Winning Kink

The best Kink published in the January issue of TEXTILE WORLD, according to our reader-judges, was:

**"Inspect Face and Back of Cloth in One Run"**

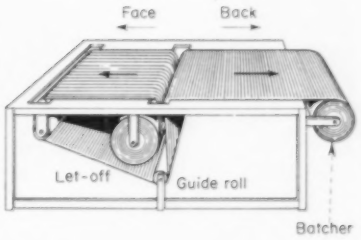
**By H. J. Haas, Martinsburg, W. Va.**

The winner is being sent a check for $25 with the compliments of TEXTILE WORLD.

The prize-winning Kink is reprinted at the right.

Each month TEXTILE WORLD awards $25 to the submitter of the Kink judged by a panel of over 300 mill men as the best for that particular month. A new batch of Kinks appears each month, and a new group of readers acts as judges each month.

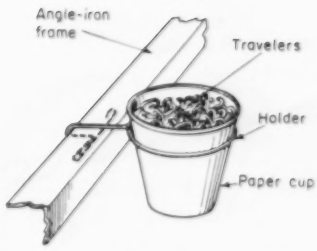
If you are asked to judge one of these days, be sure to help select the best Kink by sending back your answers in time for final tabulation. Closing date for judging is the last day of the month in which the Kink appears.




### Inspect Face and Back Of Cloth in One Run

Where it is important to inspect both the face and back of a fabric, this examining machine permits both sides to be seen in one run.

Cloth is loaded on a spindle under the table and threaded up through a center slot; then it is threaded back across the table to another slot. A guide roll mounted under the table leads the cloth back up through the center slot, from where it is carried across the table to the batching roll. Tension at the slots can be reduced by inserting rollers at the contact areas. (K-3703)

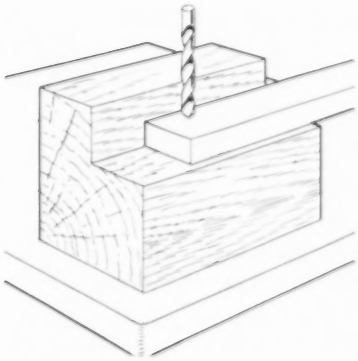



### Traveler Containers Increase Production at Downtwister

We increased production 5% at our downtwisters by making traveler holders from a piece of wire and a paper cup.

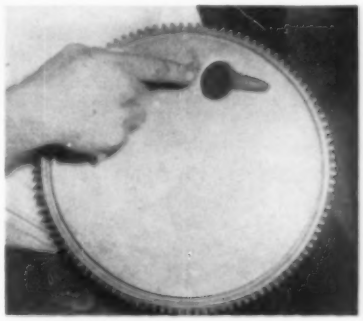
The bracket, made as shown in the diagram, is snapped to the angle-iron frame work between knock-off motions. A small paper cup is filled with travelers and placed in the wire circle.

In our plant we use four on each side of a frame, and you'd be surprised at how much lost motion on the part of operators is saved. (K-3718) *J. S. Repasch, Columbia Tape Mills, East Greenville, Pa.*



### Use a Step-Up Block For Drill Press Work

A wooden block sawed as shown in the sketch is handy for drilling with a bench-type drill press. By turning the block or using the steps, small items of different sizes can be handled without raising or lowering the drill table. (K-3527) *H. E. Wenrich, Berwick, Pa.*



### Enlarge Hole in Coiler Plate To Stop Chokes

In our combed yarn mill, we are now blending Dacron and Orlon with Sak cotton at the drawing frames to make 30s to 80s yarn for fine combed broadcloth.

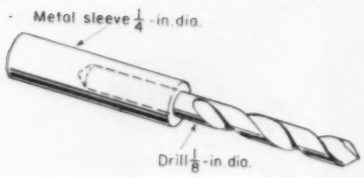
The man-made fiber is processed separately through the cards; and sometimes static causes the fiber to bunch up and cause trouble at the hole in the cards' coiler plates.

We solved this problem by opening the hole in the coiler plate and deepening the side groove as shown in the photograph. (K-3727) *Rhyne-Houser Mfg. Co., Cherryville, N. C.*

### Starch Keeps Cheeses From Sloughing Off

We used to have a lot of waste caused by cheeses sloughing off at the warper creel. When a faulty cheese was discovered, the warper threw it into a bin and often damaged it more.

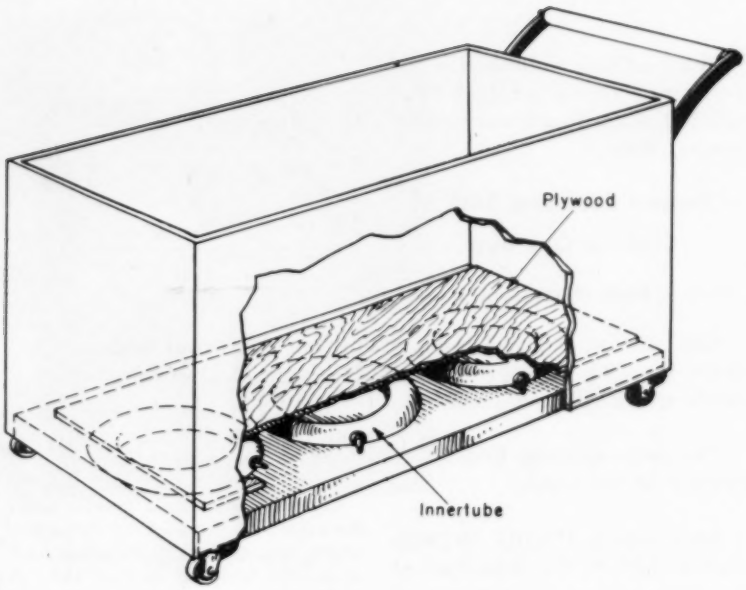
We stopped the trouble by painting the edges of the cheese with a weak starch solution. The amount of starch used is negligible, and most of it is rubbed off by the reeds and lease rods. (K-3741) *A. Crossland, Kidderminster, England*




## Sleeves for Small Drills Fit Standard-Size Chucks

Power-drill chucks are usually limited in the range of drills they will hold. For example, my present drill needs two chucks: one for $\frac{3}{64}$ in. to very small drills and the other for $\frac{1}{4}$ in. to $\frac{1}{8}$ in. It's necessary to change these chucks often to drill holes that vary greatly in size.

But I have arranged all my small drills so that I use only the large chuck. I pressed a small metal sleeve of $\frac{1}{4}$-in. outside diameter on all drills smaller than $\frac{1}{4}$ in. These drills can be changed quickly now, and I bore holes much faster. (K-3740) *Walter A. Simond, Washington, D. C.*

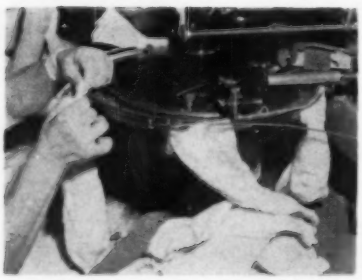



## Auto Inner Tubes in Trucks Protect Yarn From Damage

Old auto inner tubes make good cushions to protect bobbins and yarn in a truck.

Place two or more partly inflated inner tubes on the bottom of the truck. Then cover the inner tubes with a piece of plywood only a little smaller than the truck.

The inner tubes absorb all the shock as materials are thrown into the truck, and consequently the bobbins or yarn are protected from nicks and cuts. A local tire dealer can supply used tubes at little cost. (K-3655)



## Pull Socks off Looper Faster

We built an attachment on our loopers that helps our operators pull the socks off the points easier and faster. The device is a hole detector from a knitting machine, which is fastened underneath the dial close to the clipping attachment.

The spring on the attachment pulls the needle against the dial wall, and the fabric rides along the needle as it travels around the dial. A curved rod placed under the points helps guide the sock on the needle.

The needle is set just under the points so that the sock falls off the points onto the table to save the operator doing this job. (K-3743)

## Add Fabric Weight To Change Stitch

We check the stitch length on our knitting machines every day by counting the stitches per inch under a stitch glass.

If the fabric is coming off the machine heavy and the stitches per inch are one too many, we add one weight to the fabric take-up instead of changing all the stitch cams or raising the dial.

If the fabric is too light, we remove a weight from the take-up. (K-3223)

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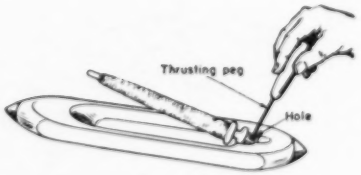
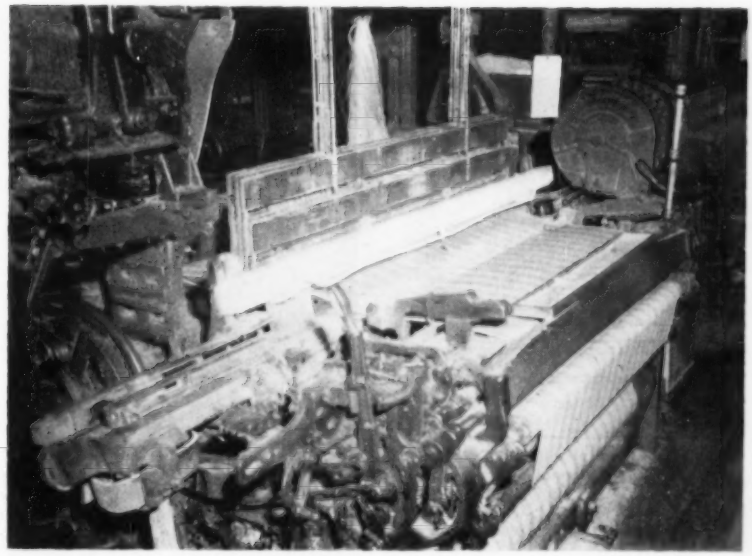
**Send in your Kink now.**




## Peg Raises Spindle For Insertion of Filling

In rayon weaving, we use a shuttle with a spindle for hand loading filling. When we are raising the spindle, the yarn is often damaged and sometimes the spindle is bent.

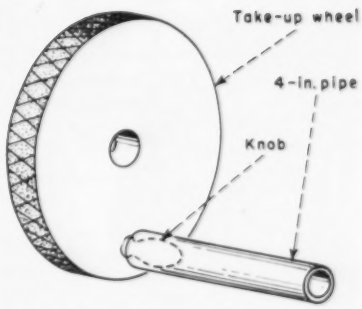
To correct the situation, we drill a 3/16-in. hole in the bottom of the shuttle and raise the spindle by inserting a thrusting peg in it and pulling it forward. The thrusting peg is made of stiff steel with a wooden handle as shown in the sketch. (K-3587) *Hokao, Fukaya, Fukui-ken, Japan.*



## White-Painted Hand Rails Are Visual Aid to Weavers

Visibility is often bad at a loom reed, and weavers have difficulty finding the right dent when they are drawing in a thread. This condition is worse when dark-color warp yarn is used or when the ends are of varied colors.

We painted our loom hand rails, (or reed caps,) with high-gloss white enamel. The white surface reflects light onto the yarn and greatly improves visibility. We have also found that the smooth finish of the painted hand rails is easier to clean and that lint does not adhere to it as it does to plain varnished rails. (K-3671)




## Take Knitted Fabric Off Machines Faster

When knitted fabric piles up under the take-up roll, it often wraps around the roll several times before it is noticed. The fabric must then be taken off the take-up by operating the take-up wheel.

A knob is provided to turn this wheel; but this knob is stationary and it is not easy to turn for any length of time. To make the job easier and quicker, we provide each fixer with a short piece of pipe.

The internal diameter of this pipe just fits over the knob to allow the pipe to turn freely, and the wheel can easily be turned in either direction with the pipe. (K-3304)

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## $500 for Best Kink in 1958 - - - $25 for Best Kink Each Month

### Plus $5 to $10 for Every Kink Accepted

What Is a Kink?

Any idea that will

- Cut costs
- Improve quality
- Reduce work
- Increase production
- Make work easier

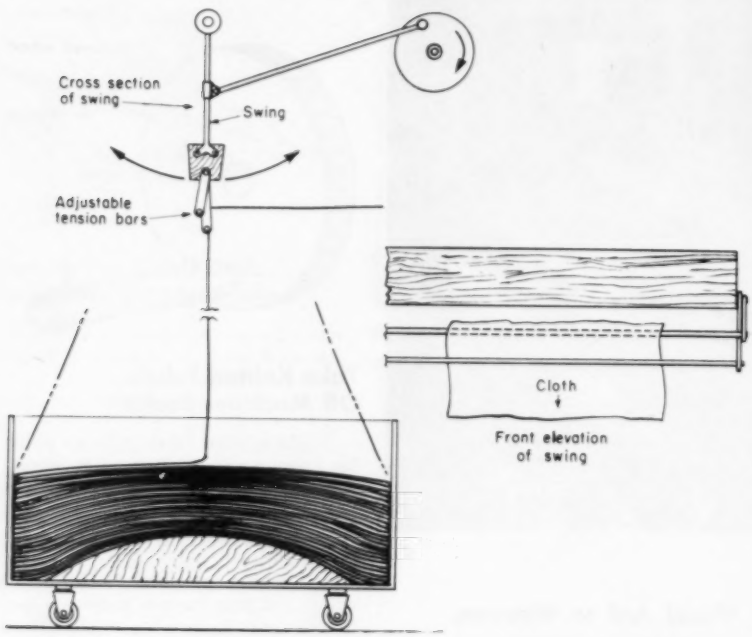
The idea may be one for improving machines, some attachment for a machine, a short-cut way of doing something, a labor-saving device—any idea at all that helps a mill man run his job better or easier.

Send in your Kink now. There is always a contest going on.

**RULES OF CONTEST**

1. No limit to number of entries.
2. New $25 prize contest every month, $500 prize contest for the year. Monthly contest confined to Kinks published that month, yearly to those published in calendar year 1958.
3. All Kinks paid for on acceptance; extra payment for photographs. Drawings need not be finished (clear detailed pencil sketches will do).
4. Previously published material not eligible for prizes.
5. Unless you advise to contrary, we assume we may sign your name to Kink when published.
6. Prize winners will be selected by readers, a different group each time. At least 300 will be asked to select preferred Kinks in each issue. Their votes will select the best Kinks, and their decision will be final. In cases of ties, duplicate prizes will be awarded.

Send Kinks to:
KINKS CONTEST, TEXTILE WORLD
201 E. Coffee St., Greenville, S. C.




## Tension on Swing Folds Cloth Without Creases

We eliminated uneven folding and creased goods in box trucks by adding a variable-tension device on the swing and making the truck bottoms convex as shown.

The goods lie perfectly in a truck modified in this way, and the slight tension provided by the adjustable bars eliminates jerky movement as the swing reverses its direction. (K-3780) *A. Droulias, Retsina Bros. Mills, Piraeus, Greece*

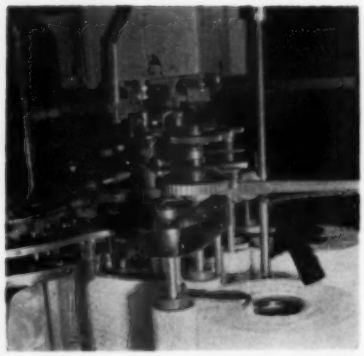
## Don't Throw Away Worn Peg Wrenches

After much use, a dobby peg wrench will become worn and slip on the pegs. The bore of the wrench extends for some distance into the shank, and the wrench can be made good as new by grinding off about ¼ in. of the end as shown in the sketch. (K-3381) *H. E. Wenrich, Berwick, Pa.*

## Here's a Handy Jig For Facing Clutch Corks

The friction corks in the clutches of W-3 and other looms sometimes wear unevenly. Formerly, we took the friction plates to the machine shop and had the corks faced on a lathe.

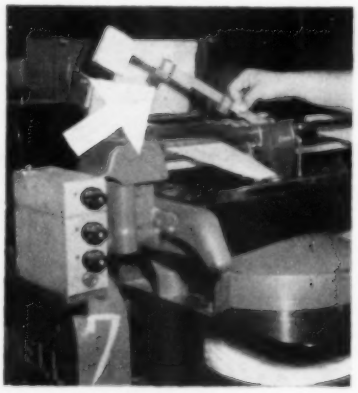
Now, with a simple jig the corks can be faced evenly in a few minutes without removing the plate from the loom. The jig is placed over a cork, and the cork is filed down flush with the edge of the jig. (K-3642) *Archie Darnbrough, Esmond, R. I.*



## Key Keeps Comber From Starting Accidentally

Sometimes combers are started up accidentally while they are closed down for repair or cleaning. If such action occurs, damage may result to personnel or to the machine.

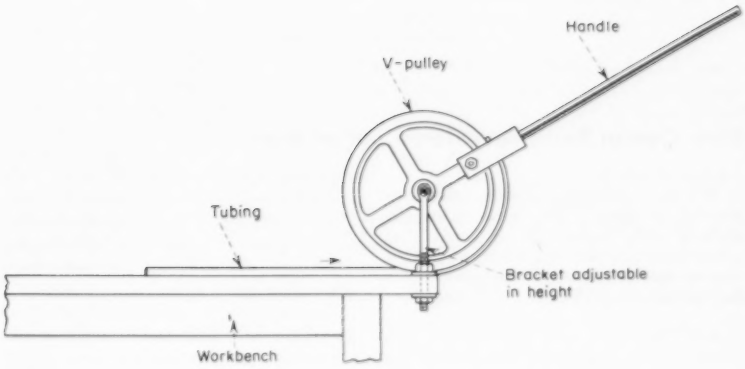
We eliminated the chance of unintentional starts by drilling a hole through the shipper arm to receive a key (arrow). When the key is in the hole, the comber cannot be started up. A chain attached to the key and stand keeps the key from getting lost. (K-3746)



## Selvage Guide Controls Orlon Web at Drawing

When we started running Orlon staple on our high-speed drawing frames, the edge of the web was ragged and pieces tended to break off.

The problem was solved by building an adjustable selvage guide (arrow) that fits in front of the delivery rolls. The attachment keeps the web in place and has cut out a lot of fly and waste. (K-3783) *Rhyne-Houser Mfg. Co., Cherryville, N. C.*




## Pulley on Workbench Bends Tubing Safely

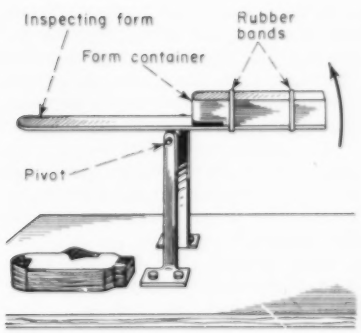
Small tubing that is easily damaged can be bent quickly and safely with a homemade jig made from a V-groove pulley with spokes.

The pulley is mounted over the end of a workbench with an axle and two brackets. The bottom ends of the bracket are threaded and fastened through the workbench so that the pulley height can be adjusted.

A 2x2-in. piece of steel 1 ft. long has a slot cut in one end the width of the pulley and 3 ins. long. A 1-in.-dia. pipe is used as a handle. A hole is bored near the end of the slot for a bolt. Then the 1-ft. piece of steel is bolted to the pulley so that it extends downward at the end of the workbench.

Tubing to be bent is laid on the top of the workbench and inserted through the slot in the steel handle bolted to the pulley.

To bend the tubing, the handle is turned upward; a 50° to 90° bend can be made as desired. For small bends, a smaller pulley is used. (K-4561)




## Inspect and Package Socks at the Same Time

Stretch socks have introduced a host of new packaging techniques. One technique involves drawing the socks on cardboard shapes. Here's one that combines the inspecting and packaging operation:

Make a metal container that holds several-dozen cardboard shapes. Leave a slit in the bottom of the holder to allow one card to fall through when the container is held in a vertical position.

Attach this container to a larger-than-normal inspecting form. Mount the form on a bracket half as high as the form. Screw the bracket to a table or bench.

The mounting must allow the form to turn 360°, but it must be adjusted so that it won't turn too freely. A sock is stretched on the form and inspected.

When the form is turned to a vertical position, a cardboard shape falls into the sock and the form is turned so that the sock can be inspected on the reverse side. While the form is in this position, the sock is withdrawn from the form and placed on a pile at the operator's right. The operator then turns the form to put another cardboard shape in position and slip another sock on the form. (K-3259)

## Concrete Slab Over Decking Forms Sturdy New Floor

Troubled by floor vibration in our second-story weave room, we found a way to convert the old wood floor into a concrete slab without seriously interfering with production.

Section by section, the top floor was removed and a 5-in. layer of reinforced concrete (arrow) was poured directly on the heavy supporting timbers. These timbers, already well supported, were strengthened from below.

The looms were replaced on each section of concrete as the work progressed; very few were out of production at any one time. The floor now is as steady as if it were poured directly on the ground. (K-3645)

## Cone Tip Will Keep Pirns From Tilting

We run nylon yarn directly off the pirn on our knitting machines. When the yarn on the pirn gets low, the pirn often tilts to one side and causes the yarn to drag.

To eliminate this trouble, we cut off the tip of a cardboard cone and push it down over the cone holder. The pirn fits tightly on the tip of the cone and will stay in a vertical position until all the yarn is run off. (K-3375)

# QUESTIONS AND ANSWERS

**Do you need help on a technical problem? TEXTILE WORLD is at your service in helping solve problems in yarn manufacturing, weaving, knitting, dyeing, finishing, and other textile operations. A large staff of mill men, consultants, and other experts are available for authoritative answers. Send your problem to the Editor, Questions and Answers, TEXTILE WORLD, 201 E. Coffee St., Greenville, S. C.**

## Prevent Broken Ends In Broadcloth Weaving

Technical Editor:

We are weaving broadcloth with 40s combed cotton in the warp and 24s combed cotton in the filling. One end breaks in the shed and causes four or five other ends to break. What can we do? (1366)

On closely woven fabrics such as broadcloth, a broken end easily breaks other ends. However, there are a number of things that can be done to lessen the breakage.

Slubs, knots, neps, and balls of hard size on the yarn will not only cause single-end breakage but will also break adjoining ends. The yarn should be as smooth and defect-free as possible.

If the yarn is stiff from excessive size, the broken end will break other ends. The addition of wax, or after-dressing, to the size will make the yarn more pliable.

Check the warp stop motion. If the stop motion is sensitive and stops the loom as soon as an end breaks, there will be less likelihood of additional breakage.

Check the harness setting and timing. If the harnesses are timed too early, there will be excessive chafing of the warp yarn by the reed and the filling yarn. Breakage will also be caused if the harnesses are set with the bottom shed too tight, too high, or too low.

A rough shuttle, a blunt shuttle tip, or a shuttle that flies crooked will break ends and pull them across other ends so that they will be broken.

## How Cotton Bales Are Stored out of Doors

Technical Editor:

We are considering storing baled cotton out of doors. The bales are usually covered with burlap or cardboard that offers some medium of protection. We'd like to use polyethylene-film covers. Is this practical? (1358)

Cotton bales are stored in gin yards in the Southeast for periods up to four weeks. Most of this cotton sits flat on the ground, but timber dunnage is used in some areas.

There is little or no open storage in the Mississippi River Valley, but most of the crop in the Western area is stored in the open for extensive periods. Dunnage is used extensively in California.

There has been considerable attention devoted to the problem of covering bales stored in the open with polyethylene. The National Cotton Council explored this matter in some detail with a number of packaging firms and West Texas warehousemen about five years ago.

There were a number of practical problems involved, but the major obstacle was simply that the cost of the cover was more than the cost of cleaning the bales before the bales were shipped from the warehouse.

There has been frequent activity in this field in recent years, and several hundred open-storage bales are being covered experimentally in paper covers this year in the West Texas area. However, to the best of our knowledge there is no commercial use of such materials at this time.

## Warp-Printing Processes Give Long Repeats

Technical Editor:

Do you have any information on random long-chain warp dyeing that will give up to eight different colors with 10-ft. repeats in the same warp? (1356)

Random dyeing of such repeats would have to be done manually. The warp is tied tightly in places to prevent color migration, and the color is locally applied in chain form.

Two types of machines can be used to print 10-ft. repeats, however. One machine has a large vertical cylinder on which the warp is wound. The width is optional, and the repeat can be adjusted by pegs fitted in the sides of the drum. These pegs operate an electric switch as the drum revolves.

The drum is stopped over the appropriate color, which is contained in a small trolley. A felt application roll dips into the color, runs across the warp, and returns in the same position to print a bar of color.

The cylinder is rotated as far as necessary for the next register peg to engage the switch. The next color is then applied.

The motor on the printing cylinder should have a brake for quick stops. After printing, the warp is unrolled from the cylinder and after treated.

With a stencil machine, any number of colors can be printed on the warp. There are a number of cylinders that rotate by their own weight on a resilient table along which the warp is drawn.

The printing cylinders contain the color and a doctor blade that keeps the color from moving up as the drums rotate. The drum is perforated to suit the pattern.

Each drum prints its own color. The drums are suspended from a register rail near the ceiling so that they can be moved to their exact position.

Printing colors must be kept viscous to keep from smearing on the table. A waterproof cover should be on the table so that the table can be cleaned when colors are changed.

The machine speed is adjusted to the yarn and the color used. The warp can be run over dry cans or a hot-air dryer and passed through a curing chamber for pigments and a steam box for soluble colors to fix the color on the fibers.

## How Cloth Is Inspected After Weaving

**Technical Editor:**

**What are the current methods of inspecting cloth after weaving? (1364)**

After weaving, cloth is inspected either on frames or on tables. Some of the cloth is folded in 1-yd. folds. The usual procedure for inspecting such folded cloth is to spread it out on a table. A 72-in. surface is thus exposed on the table.

These tables are about waist high and usually have the top sloped toward the inspector at about a 10° angle. The inspectors usually grade and burl the cloth and make a report of defects. Sometimes a short colored string is looped in the selvage to show the location of a major defect. Inspector-burlers can go through about 4,000 yds. of cloth in an 8-hr. shift by this method.

Motorized machines, frames, and tables are commonly used for inspection of plain cloth. Many of these inspecting devices are made at the mills that use them.

A table similar to that used for hand inspection has opal glass over part of its top, and fluorescent lamps are mounted beneath the glass. The cloth is placed in a cradle on one side of the table and is pulled over the table by rubber-covered rolls powered by a small electric motor.

An inspector can run 30,000 yds. of cloth over these tables in 8 hrs.

A common type of inspecting frame is one that pulls cloth from rolls or folded cuts, passes it in front of the inspecting lights, and rerolls or folds the cloth after it passes over a framework above the inspection.

These powered tables and frames have idle pulleys or slip clutches, and some of them can be reversed. They are usually rigged so the movement of the cloth can be controlled by a foot pedal, leaving both hands free.

## Overwax Warps With Blended Wax

**Technical Editor:**

**We have been overwaxing our warps with paraffin wax and find that although weaving is improved, we have a lot of trouble with the wax in the dyeing and finishing operations. Can you suggest any scouring materials or methods that will keep the wax in suspension? (1367)**

Straight paraffin wax will give you trouble as soon as the goods get to the dyehouse. We think that no economically feasible scouring method will help you.

However, by blending the paraffin wax with a saponifiable fat that has been partly converted to a soap, you may be able to get the benefits of overwaxing without the troubles.

We suggest that you try mixtures of paraffin wax plus stearic or oleic acid that has been partially saponified. A trial formula that might serve as a starting point is—

50% paraffin wax 124° F. melting point
30% stearic acid
6% potassium hydroxide
14% water

Melt the wax and the stearic acid together, and then add the alkali dissolved in the water. Stir and keep hot until the water content is low enough for your purposes.

You can reduce the amount of alkali or substitute sodium hydroxide for potassium. The sodium will produce a hard soap, the potassium a soft soap.

The idea is to provide an emulsifying substance intimately mixed with the paraffin in sufficient quantity so that when the goods are scoured, the soaps or detergents used in that operation will have much less work to do in keeping the paraffin from gumming up equipment or causing dyeing troubles.

## Tips To Preserve Knitted Fabric Elasticity

**Technical Editor:**

**We bleach our tubular knitted fabrics with chlorine. The elasticity of the fabric is good for a time, but it fails after a few washings. Do you have any suggestions to preserve the elasticity? (1362)**

Such bleaching should not affect the elasticity of your fabrics, although many better-grade cotton knitted fabrics are now bleached with peroxide. The long steep at 170 to 180° F. in the peroxide bath produces the clean and bleached fiber and yet preserves the elasticity so necessary in fabrics required for underwear.

Knitted fabrics for chlorine bleaching should be scoured first. Get the fabric as clean as possible, and bleach in a cold hypochlorite bath of 0.5 to 0.7 grams per liter available chlorine at 9 to 10 pH. The time in the bath will depend on the degree of whiteness you want, but it should not exceed 1 hr.

Rinse the goods free of alkali, sour with a weak solution of $SO_2$ or acetic acid, and rinse until neutral. A small amount of cationic softener in finishing might help. Dry the goods, and be careful not to overdry them.

## Humanics — A TW Brief

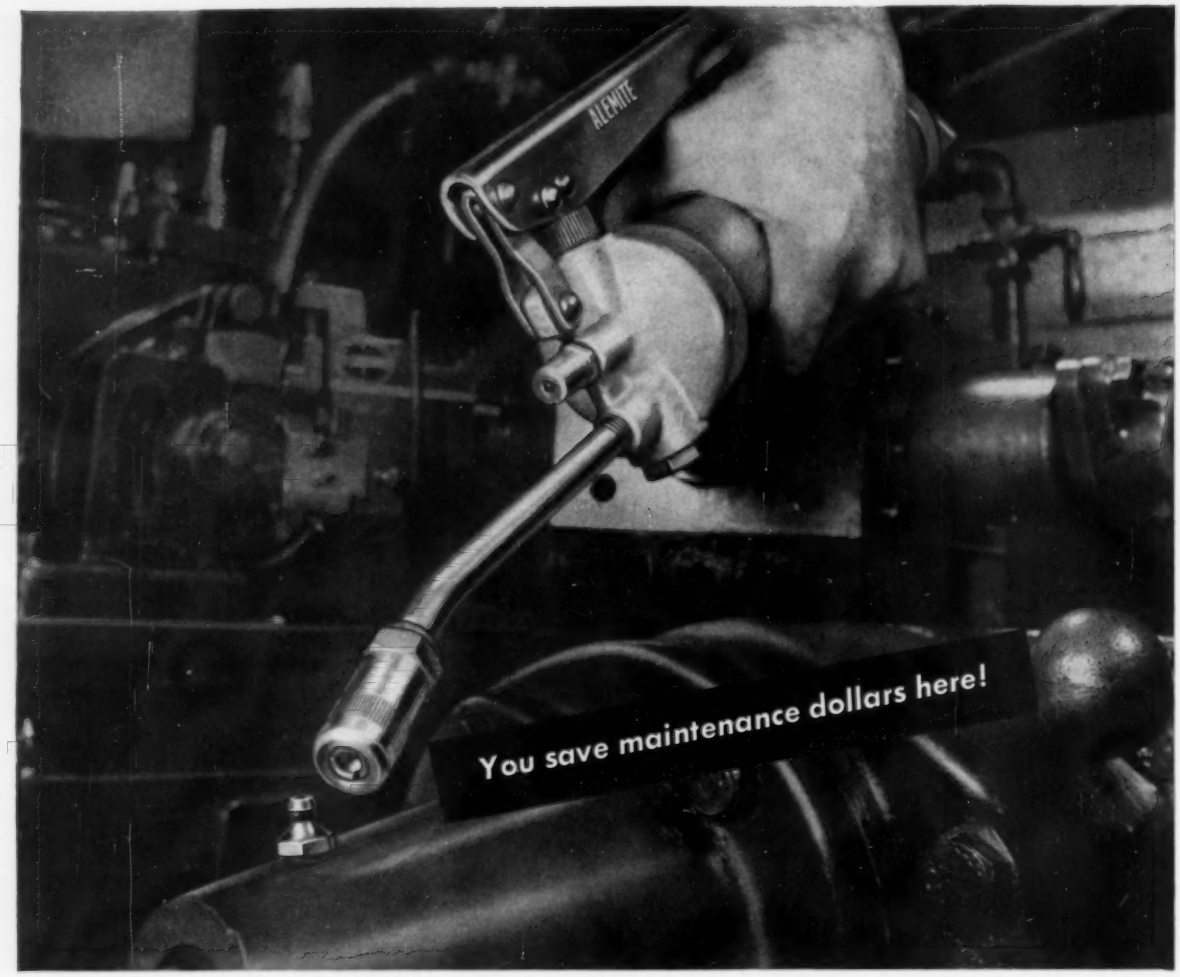
### Does Supervisory Training Pay?

**Jim Bramlett finished a company-sponsored course in job-methods training. He got some good ideas that could be applied to his job but ran into opposition when he tried to make the necessary changes.**

**His superior had not attended the classes and was opposed to what he called new-fangled ideas. Jim not only lost all interest in job improvements but came to consider any sort of training as a waste of time.**

**To be successful, any kind of supervisory-training program should be well-planned. If the training is for something that can't be put to practical use, it has little value. Also, the type of training and results desired should be agreed upon by all levels of management before the training is inaugurated.**

**Training courses that do not have the full support of a management that is willing to try out ideas developed as a result of the training can do more harm than good. Many young supervisors like Jim Bramlett will become disillusioned and develop closed minds if they are not given room to try out new ideas and methods.**

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The point of lubrication is where maintenance costs can be cut—providing you have the right equipment for the job!

This heavy-duty Alemite hand gun—combined with genuine Alemite lubrication fittings—brings up to 10,000 lbs. of pressure to even ordinary lubrication points. It gives you power to spare for fast, efficient, money-saving protection of every machine in your plant!

Gun handles all regular pressure gun greases. Long operating handle for maximum leverage. Loader fitting permits fast, clean filling (or gun may be filled by suction). Heavy steel linkage for true piston alignment. Capacity, 1 lb. Get more out of man-hours and machine-hours with Alemite lubrication equipment!

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## Wide Setover Pin Drafter

A wide setover pin-drafter intersecting draw frame, announced by Warner & Swasey Co., Cleveland, Ohio, features wider pinning, close nip control on short staple, and greater versatility. This model provides 33% more pinning area and input capacity than previous models and can be used for all precombing jobs such as backwashing and assembler operations.

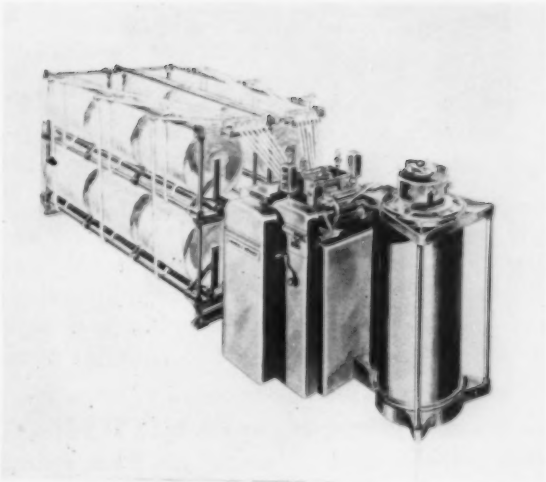
The machine can be equipped for either single or dual can or ball delivery, and it requires about the same floor area as the pin-drafter equipment. The new balling-head unit consumes only half the space of older models and delivers a ball up to 18x24 ins. weighing 50 lbs.

The longitudinal variable-drive ball creel accommodates 12 such packages or additional smaller ones and is equipped with a new type of stop-motion mechanism for individual positive end control. The single-delivery machine accommodates a 15x36-in. can or a jumbo 20x42-in. can with nearly double capacity.

A new single-lever clamp provides close nip control and easier operation. Increased evenness in stock delivery is assured through uniformly distributed pressure. One handle adjusts for all pressures. A 35-lb. pull on the handle exerts about 1,000 lbs. pressure on the nip roll.

A lap-detector stop motion is also part of the clamp assembly. This stop motion stops the pin drafter before laps can build up on either the drafting or pressure rolls.

The 8-in. plastic bonded faller bars work at 1,500 faller drops per minute. A 5-hp. motor drives the pin drafter through a combination of gear, belt, and chain drives. A reversing-can turntable, powered by a ¼-hp. motor and control system, is optional.



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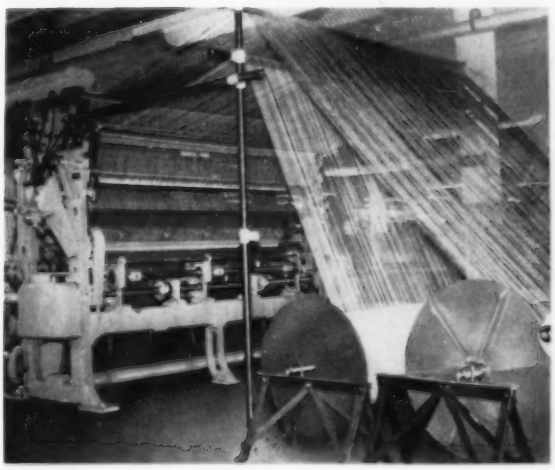

## Pile Knitting Machine

The pile knitting machine developed by Karl Lieberknecht, Inc., Reading, Pa., is now being made 200 ins. wide. The production of carpet fabric from this machine is expected to be about 30 yds. per hr.

The pile attachment is a separate cam-actuated mechanism that picks up and draws off the loops of pile yarn. This motion is positive, and the height of pile can be adjusted accurately and easily.

Pattern possibilities are derived from one of two methods or a combination of both. Colors or textures can be introduced by using more than one type of pile yarn, which can be run from separate beams, or different yarns can be warped on a single beam. The guide-bar motion can be used to move the yarns in geometrical designs to form patterns.

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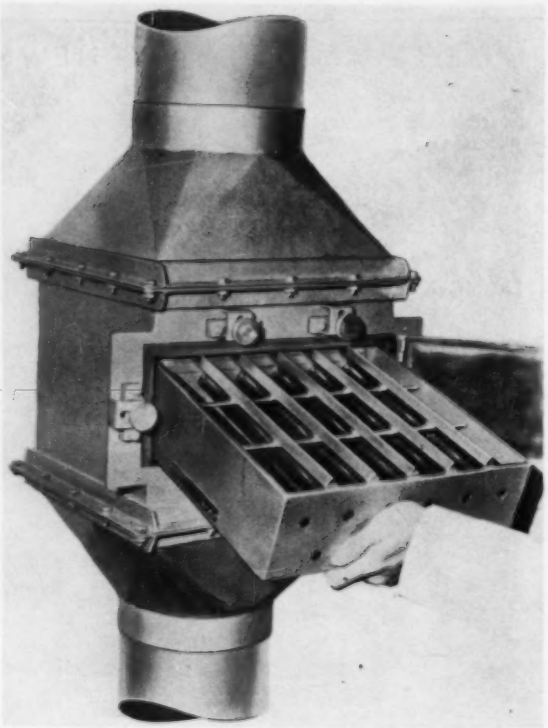


## Tramp-Iron Separator

A permanent magnetic-grate separator, designed as a packaged unit for quick, easy installation in vertical gravity-flow lines, has been announced by Eriez Mfg. Co., 1425 Grove Drive, Erie 6, Pa. The new unit is available in models specifically adapted for removal of either tramp iron or fine iron.

Installation work is reduced greatly by the new magnet, which incorporates the grates and their housing in a single package. A hinged and gasketed door front encloses and holds the double-banked magnetic grates so that access to the iron is easy.

For applications involving material of a nature that will not flow readily through the series of openings between the tubes composing the grates, the units can be supplied equipped with a vibrator mounted on the housing.

**Circle T-3 on Reader-Service Card**

## Optical Instrument

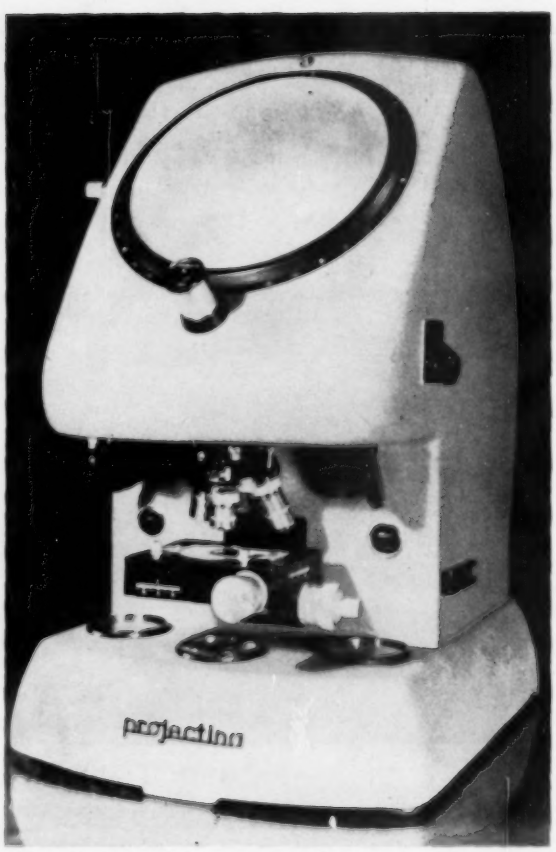
A multipurpose optical testing instrument, marketed by Alfred Hofmann & Co., 629-635 59th St., West New York, N. J., combines a microscope, projector, comparator, and camera. Any image previously projected on the screen in the magnification range of 7X to 2,000X can be photo-recorded in black and white or color.

Microscopic pictures can be seen on a 7-in. ground-glass screen and through an eyepiece without refocusing. Built-in illuminators allow for easy microscopy and projection in transmitted bright and dark field and surface bright and dark field.

The light intensity is variable by finger-tip control. There are stationary stages for large specimens, mechanical stages with vernier reading of 0.1 mm., and high-precision mechanical stages that permit readings of 0.001 mm. on the measuring knobs.

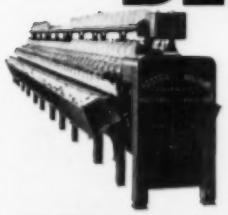
Vertical adjustment is enough to permit comparatively thick specimens and appropriate fixtures to be mounted on the stage. Standard screens are offered in eight variations from plain to vernier or angular reference lines. All screens interchange readily and maintain exact magnification.

**Circle T-4 on Reader-Service Card**

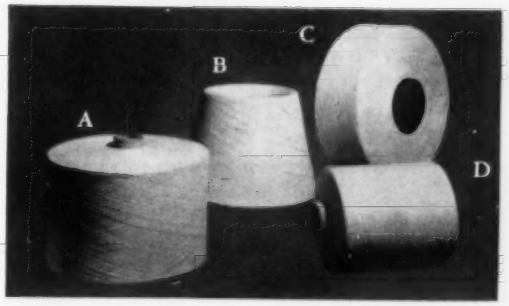


# THE BIG 3 BENEFITS

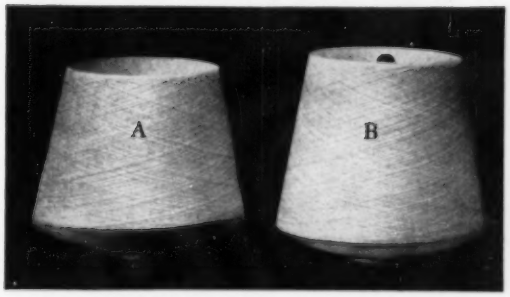
**Flexibility**
**Economy**
**Quality**



## They're Yours with the FOSTER MODEL 102




A — Warping cone
B — Knitting cone
C — Short traverse cheese
D — Dye package




A — 6″ traverse cone. B — 7″ traverse cone holding 10% more yarn.

Top, side and bottom of Model 102 knitting cone, showing convex base, perfect shape and uniform wind.

801-7

**Flexibility**— Will handle any count (except coarsest) or type of spun yarn — soft twist as well as hard twist • Any angle of wind from 9° to 18° • Any taper commonly used • Knitting cones, warping cones, dye packages, or short traverse cheeses (when machine is properly equipped) • Conditioned yarn as well as dry yarn — even dye packages which are damp in the middle • Density of packages easily regulated.

**Economy**— Operating cost ⅓ less than that of obsolete machines because of high winding speeds, self threading tension devices, easy doffing (package holder swings out), empty bobbin conveyor discharging into standard size truck, 7″ traverse packages (if specified) holding 10% more yarn, negligible repair costs (as low as $10 per yr. per 100 spindles), low maintenance (any competent fixer can take care of it).

**Quality**—The Foster Open Wind Cone is standard for the knitting industry • Automatic inspection of yarn through slub catching attachment • Any degree of yarn conditioning desired • Convex base cone prevents underwinding and nipping • Ribbon breaker (originated by Foster) prevents ribbon wind • Idler shell on drum prevents chafing • Adjustable angle of wind assures properly wound cones that will hold their shape in transit and deliver efficiently at knitting machine • Minimum tension on soft twist yarns minimizes breakage.

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**FOSTER MACHINE COMPANY**

*A Yarn Winder for Every Purpose*

Westfield, Massachusetts, U. S. A.

Southern Office—Johnston Bldg., Charlotte, N. C. • Canadian Representative—Ross Whitehead & Co. Ltd., 1475 Mountain St., Montreal, Que. and 100 Dixie Plaza, Port Credit, Ontario • European Representative—Muschamp Textile Machinery Ltd., Keb Lane Bardsley, Oldham, England.



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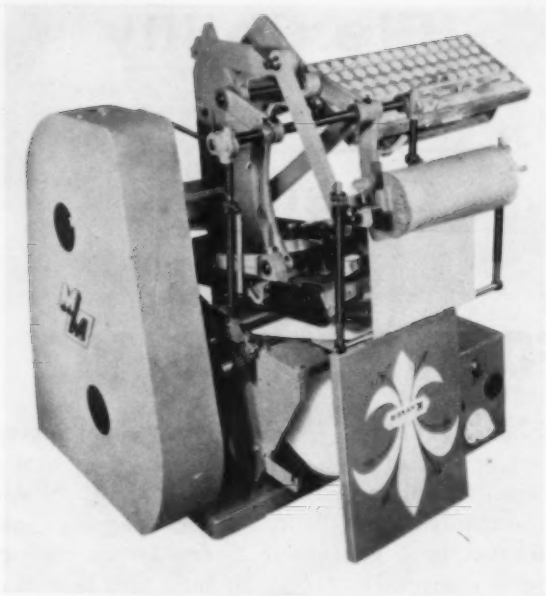


## Leaf Printer

Model 45G leaf printer, developed by Markem Machine Co., Keene 81, N. H., does a variety of leaf embossing jobs where high-quality imprints on boxes, bags, and envelopes are needed. The machine is specially suitable for making light imprints on dark backgrounds or for materials that cannot be marked clearly with other marking compounds.

A full range of colored leaf is available. Color changes can be made rapidly, and multiple color prints made in one operation are possible. Maximum imprint area is 5⅞ ins. wide and 2 1/16 ins. high. One operation is needed to mark each box, and the machine makes 45 imprints per minute.

A thermostatically operated preheater keeps the type warm for ready use. All characters in the type bars can be changed quickly. The standard inking mechanism can be used to permit the use of regular paste and liquid marking compounds.

**Circle T-5 on Reader Service Card**

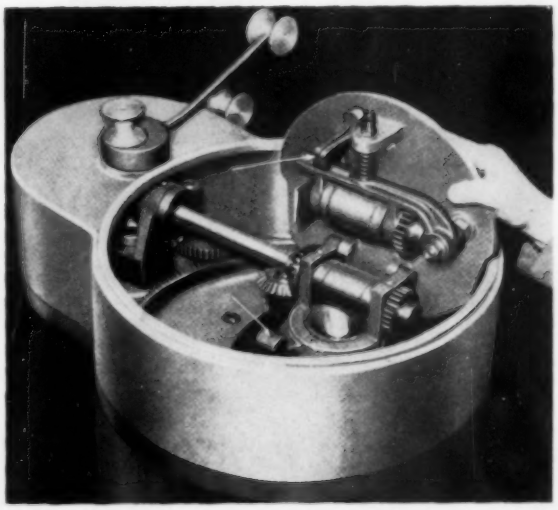
## Two-Can Coiler

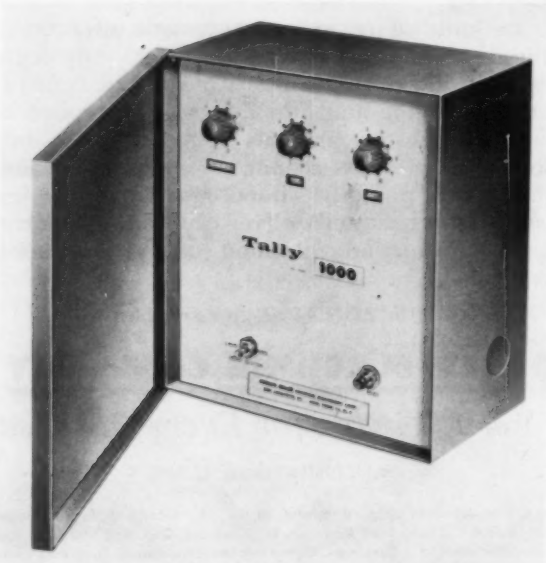
A two-can coiler for cards has been announced by Tweedales and Smalley Ltd., Lancashire, England.

The mechanism supplies two stationary 12-in. cans instead of the usual revolving can. When a predetermined length of sliver has been placed in one can, the coiler head swivels and starts filling the other can without loss of production.

The coiler head, which is only slightly larger than the single-head coiler, can be attached easily to any card.

**Circle T-6 on Reader Service Card**






## Predetermined Counter

A counter that can be set to accurately count and control operations in packaging, batching, cutting of specified lengths, etc., has been announced by Hobson Miller Machinery Corp., 280 LaFayette St., New York 12, N. Y.

Called the Tally 1000, the counter may be actuated by photoelectric control, impact switch, limit switch, pressure switch, flow meter, or any type of single-pole, single-throw switching device.

The counter has a counting rate of up to 450 per min. and a count selectivity of 1 to 1,000. Higher-speed units and counters for greater selectivity are available.

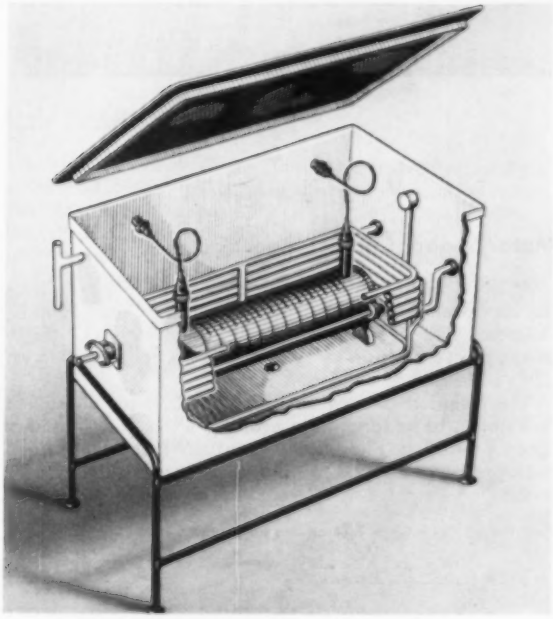
**Circle T-7 on Reader Service Card**

## Fabric Burn Tester

A fabric burn-hole tester announced by Custom Scientific Instruments, Inc., Kearny, N. J., determines the resistance to heat of fabrics, upholstery, and plastics.

The instrument has a small heat source capable of being maintained at constant temperature. This heat is made to impinge on the sample, which is in a horizontal position and under no tension prior to the impingement.

**Circle T-8 on Reader Service Card**



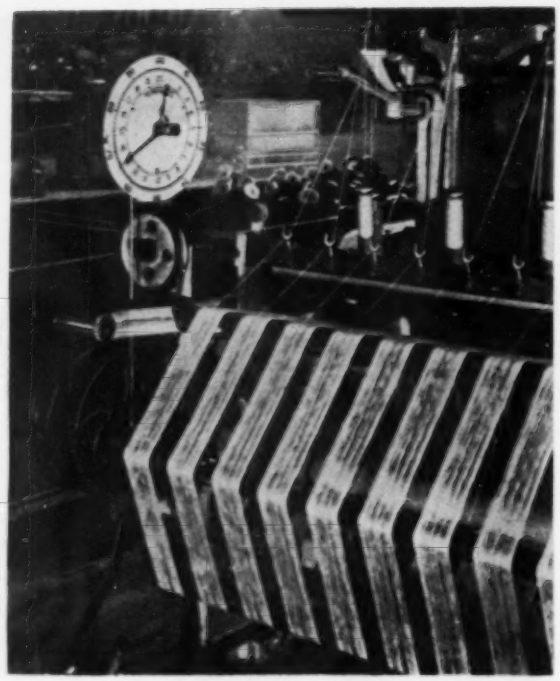
## Hypochlorite Producer

A machine for the electrolytic production of sodium hypochlorite has been introduced by Paterson Engineering Co. Ltd., Windsor House, Kingsway, London, W. C. 2, England.

The machines are available in several capacities that produce from 0.5 to 10.0 lbs. of chlorine per hour. Current consumption varies from 2 to 57 kwh.

The electrolyser can be operated with solutions of common salt or sea water, whichever is most economical at the point of use. The sodium hypochlorite produced by the machine can be used directly or stored for future requirements.

**Circle T-9 on Reader Service Card**



## Swift Revolution Counter

A clock-face swift revolution counter announced by Prince-Smith and Stells Ltd., Keighley, Yorkshire, England, is a great help to the reeler because it shows at a glance the length of yarn on the swift at any time. The counter also insures the accuracy of the number of rounds put on the swift.

The counter automatically registers the number of revolutions on the swift, and it can be used with the normal knock-off motion.

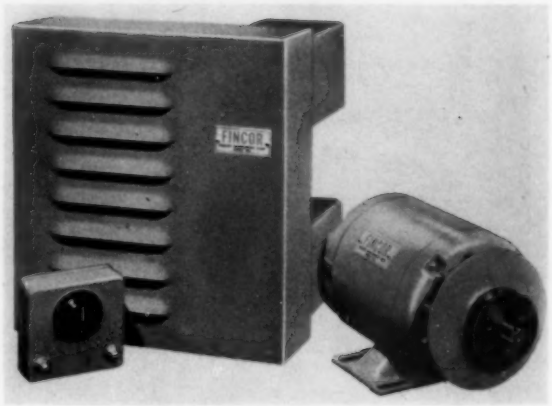
**Circle T-10 on Reader-Service Card**

## Motor-Speed Control Package

A motor-speed control package for variable-speed drives has been announced by Fidelity Instrument Corp., 1000 E. Boundary Ave., York, Pa. It is furnished with a.c., three-phase, 60-cycle motors of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{3}$, or $\frac{1}{2}$ hp. for operation on 220 v. Motors are in NEMA 56 frames.

The complete package includes motor, frame, a built-in tachometer to sense motor speed, and a magnetic-amplifier speed controller. The unit is essentially a constant-torque motor drive with power output proportional to motor speed.

**Circle T-11 on Reader Service Card**




## Yarn-Bundle Tensile-Strength Tester

A yarn-bundle tensile-strength tester has been announced by G. P. De Clercq, 9 Andre Bernheimlaan, Gentbrugge, Belgium. The tester stretches a bundle of 100 to 200 strands at a constant rate, breaks them successively, and records the frequency distribution of the breaking elongations.

The instrument electromagnetically fixes 100 or 200 strands from 10 or 20 bobbins under a normalized initial tension on a length of 50 cm. between jaws. The maximum force attained by the bundle is highly correlated with the lea or skein strength of the yarn and permits the estimate of the mean strength of the yarn.

The instrument is suited for measuring the breaking elongation characteristics of sized yarns. Ten to 20 yarns are taken at random from the yarns leaving the drying chamber after sizing and wound on a separate reel.

The reel is put on the instrument, and the sized yarns can be quickly tested over the whole length of the beam. The evenness of sizing can be tested by examining the strength variation, while the yarn tension during the operation can be controlled by the study of the breaking elongation.

**Circe T-12 on Reader Service Card**

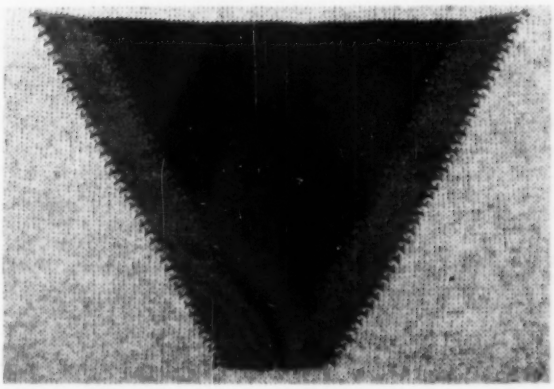
## Inside Selvage Attachment

An improved selvage attachment introduced by Textile Machine Works, Reading, Pa., for intarsia designs increases the scope of full-fashioned outerwear machines. Patterns can now be knitted with various split arrangements such as a single-needle open and a two-needle closed split.

Merging lines between designs and main-body fabrics become sharp and distinct because the method used is similar to that used on hand frames. Perfect interlocking of loops is maintained by repositioning the selvage ends of the design yarns after the course is laid and while the loop formation takes place.

This technique eliminates the customary overlapping of yarns that tend to destroy fabric elasticity. This selvage attachment is particularly effective in straight-line design knitting or for vertical pattern effects where sharply outlined designs are required without sacrificing elasticity.

Where the single-needle open split is used, vertical and horizontal merges are similar in outline and tend to blend into the basic garment color even where shades of extreme contrast are used. The attachment is readily adaptable to knit irregular or nonsymmetrical designs. The two-needle closed split procedure should, however, be used to knit such designs.



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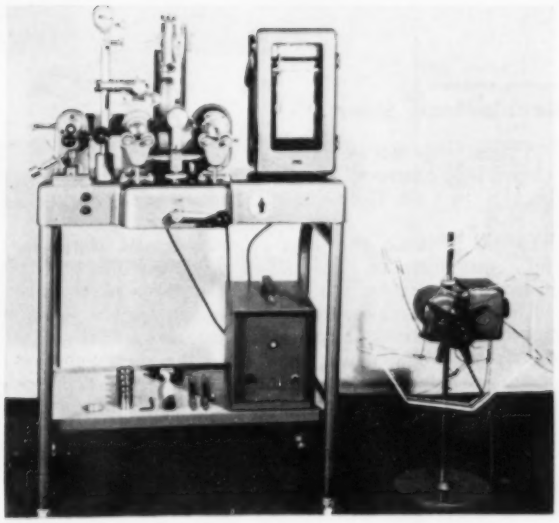

## Yarn Elasticity Meter

A textile elasticity meter built by Textechno Herbert Setin, M. Gladbach, Germany, uses an electric induction system to determine elasticity of yarn in 35 grades of tension up to 500% stretch, diameter evenness, fiber adhesion, and friction coefficients toward outside materials.

The sensitivity of the electric measuring, which controls the graphic recording, is widely variable. The zero point may be set back by a multiple of the calibration width.

A stress load is applied to a yarn to cause a change of plastic shape. The power of the thread is registered electrically and recorded. The power balance reveals the friction coefficient. The cylinder can be replaced by brakes, rods, hooks, or loops.

Circle T-14 on Reader-Service Card

## Textile Truck Caster

A caster for textile trucks that will not pick up lint or yarn has been developed by American Pulley Co., 4200 Wissahickon Ave., Philadelphia 29, Pa. The caster has a steel wheel and a rubber tread, and the center is pressed steel. It is also available with semisteel plain-tread wheels.

Large grease cavities are lubricated at the factory for long trouble-free life. All wheels have sealed ball bearings, but grease fittings are provided if greasing becomes necessary.

The casters have horns so that wheels can be changed to different sizes in your mill; for example, one caster assembly is for both 4-in. and 5-in. wheels.

Circle T-15 on Reader-Service Card

## Arygle-Sock Attachment

An attachment to make Morpul tops on Banner SCP and SCOP machines has been developed by H. E. Crawford Co., Kernersville, N. C. The attachment has an extra yarn finger so that none of the regular yarn fingers need to be used to put the reinforcing yarn in to make the top.

The attachment comes complete with the extra finger and two yarn tensions mounted on a bracket. The first four courses of elastic yarn that go in the make-up are on a loose tension, and the other courses in the top are made with a tight tension to even the make-up courses and the regular top courses of elastic.

Circle T-16 on Reader-Service Card

## CORRECTION

Two items in the November Equipment & Supply News section were incorrect.

To clear up any confusion that may have resulted, the items are presented here in correct form.

### High-Pile and Velvet Shear

A shear that will handle fabrics with ⅛- to ½-in. pile has been developed by Curtis & Marble Machine Co., 72 Cambridge St., Worcester, Mass.

A movable rest presents the fabric at the proper angle to the edge of the ledger blade, and the shearing is done by the revolvers as they engage the fibers between the spiral cutters and the ledger blade.

A variable-speed brush lifts the pile for shearing as it passes under tension to the movable rest.

The settings for the rest, ledger blade, and spiral cutters are controlled by a wheel regulator with a numbered dial that permits resetting the shear exactly for each style of fabric.

Cloth speed can be varied from 8 to 24 yds. per min. through a variable-speed transmission.

The shear is available in 60- and 72-in. working widths and is furnished with a cloth-roll feed stand and back arms. A folder is available if wanted.

The machine is engineered to handle both woven and knitted man-made-fiber fabrics.

**Circle T-17 on Reader-Service Card**

### Double-Head Shear

A shear with two stationary cutting heads has been developed by Vollenweider Ltd., Switzerland, represented in the U.S. by Cosa Corp., 405 Lexington Ave., New York 17, N. Y.

In this machine, the shear cylinders remain stationary and adjustments for height of shearing and the passage of seams are made by raising or lowering the shearing beds.

The machine is slowed down automatically as seams approach the knives and returns to normal speed after the seam passes. The rigid mounting of the shear cylinders permits shearing to within 0.004-in. accuracy.

The shearing cylinders are mounted vertically, which allows the operator to check all phases of the shearing operation from one spot.

A variable-speed drive provides cloth speeds of 5 to 65 yds. per min., and the cylinder speeds may be varied from 500 to 1,500 rpm. Standard machines will accept fabrics up to 63 or 78 ins. in width.

**Circle T-18 on Reader-Service Card**

### Shading Light

An 8-ft. full-spectrum color-shading lamp has been introduced by B. J. Philips Co., 110 W. 30th St., New York, N. Y. The large fixture permits accurate shading of full cutting lots under daylight conditions.

The unit is equipped with four Absolute North Sky Illumination lamps with full-spectrum coverage. A switch permits use of all four or two of the lamps for dark or light fabrics. A shading table that is designed to complement the fixture is available.

**Circe T-19 on Reader-Service Card**

### Drafting Apron

A drafting apron with an engraved inside surface has been developed by Dayton Rubber Co., 2342 Riverview Ave., Dayton 7, Ohio.

The new design minimizes chatter, reduces waste collection, and improves the action of the apron over the nose bar. The outside surface remains unchanged.

Initial production is confined to D-60 or larger sizes for drafting systems not having fixed centers, but the entire Dayco line will soon have the new surface.

**Circle T-20 on Reader-Service Card**

CONTINUED ON PAGE 186

Textile World

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**NEW LITERATURE:**

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TEXTILE WORLD, A McGraw-Hill Publication, New York 36, N. Y., March, 1958

# *Outstanding* NEW LITERATURE
## *Free for the Asking*

**NO REPEATS** . . . Listed here for March are current bulletins reviewed by the editors of TEXTILE WORLD. To get the ones you need, circle the number on the Reader-Service card, as described on the preceding page.

### TEXTILE MACHINERY & AUXILIARY EQUIPMENT

**Process equipment**—For mixing and blending described in Bulletin No. PE-5802 from H. W. North Co. (F-1)

**Cleaning machinery**—Including wet-blast, air-blast and dust-control equipment described in Catalog No. 951-D from Wheelabrator Corp. (F-2)

**Package humidifier**—Description and specifications included in Bulletins H-5 and H-6 from Standard Engineering Works. (F-3)

**Projecting microscope**—For testing fibers, fabrics, etc., described in booklet from Hoffman & Co. (F-4)

**Drives and motors**—For many applications are listed in Bulletin A-2400 issued by Reliance Electric & Engineering Co. (F-5)

**Card drive**—Specifications and installation data given in Bulletin 6100. T. B. Wood's Sons Co. (F-6)

**Switchgear and circuit breaker**—Featured in Bulletin 6004-C from I-T-E Circuit Breaker Co. (F-7)

**Machinery maintenance**—Testers described in booklet from International Research & Development Corp. (F-8)

**Compressed air dryers**—A 12-p. bulletin describes heatless, self-activating dryers by Van Products Co. (F-9)

**Purifiers**—For air and steam described in Bulletin 502 from V. D. Anderson Co. (F-10)

**Abrasion-testing set**—Operation and line of accessories described in Bulletin 5706 from Taber Instrument Corp. (F-11)

**Electric motors**—Of 1 to 125 hp. discussed in Bulletin B-2506 issued by Reliance Electric & Engineering Co. (F-12)

**Grit-collecting** — And grit-washing-equipment data included in Booklet 2571 from Link-Belt Co. (F-13)

**Gear motors and controls**—For drives, valves, pumps, and other applications outlined in Bulletin J-101 from Jordan Co., Inc. (F-14)

**Packaged drives**—For machines requiring adjustable speed described in Bulletin 20,000 from Clark Controller Co. (F-15)

### SUPPLIES & CHEMICALS

**Chemical hardener**—That hardens concrete floors and makes them dustproof is described in brochure from L. Sonneborn Sons, Inc. (F-16)

**Silica gels**—Hydro gels and other synthetic silicas introduced in Bulletin No. MAC issued by American Industrial Chemical Co. (F-17)

**Silicones**—Reference guide describes 150 available silicone products made by Dow Corning Corp. (F-18)

**Polyvinyl alcohol**—Manual containing full information on the physical prop-


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erties of the various grades of Gelvatol available from Shawinigan Resins Corp. (F-19)

**Amyl acetate**—Technical bulletin presents properties, specifications, and applications of amyl acetate available from Union Carbide International Co. (F-20)

**Weaving specialties**—Are described in a folder from Engineered Plastics, Inc. (F-21)

**Soluble silicates**—A folder describing industrial cleaning with silicate detergents is available from Philadelphia Quartz Co. (F-22)

**Resins and plasticizers**—Are described in a 12-p. brochure from Pennsylvania Industrial Chemical Corp. (F-23)

**Chemical resistance** — Charts for safety clothing included in booklet from Milburn Co. (F-24)

**Aluminum sheet and foil**—Available from its Ravenswood, W. Va., rolling mill described in folder from Kaiser Aluminum & Chemical Sales, Inc. (F-25)

## MAINTENANCE & ENGINEERING

**Steel unions**—Are discussed in a brochure entitled, "What Makes a Good Union?" Clayton Mark & Co. (F-26)

**Glass pipe and fittings**—Design, engineering, and installation described in Bulletin PE-3 from Corning Glass Works. (F-27)

**Centrifugal pumps** — Described in Flyer 7148-A from Ingersoll-Rand Co. (F-28)

**Thermal wells**—Specifications and applications included in catalog from Fenwal, Inc. (F-29)

**Hydraulic fluids**—"Selection, Operation, and Maintenance of Hydraulic Fluids for Industrial Machinery" is the title of Bulletin No. 1300SA issued by Vickers, Inc. (F-30)

**Electrical controls**—Suitable for use with virtually any detectable variable are described in Bulletin 106 from Assembly Products, Inc. (F-31)

**Bearing units** — Pillow blocks and flange blocks are described in Catalog BU-101 from Browning Mfg. Co. (F-32)

**Toggle switches**—Ten standard types are listed in Catalog 100-1 from Sargent Electric Corp. (F-33)

**Tank gauges**—Bulletin F-40 describes


NØELTING

# Faultless Caster

## Materials Handling FACTS

### INCREASING TEXTILE PRODUCTION AND DECREASING COSTS AT RUSSELL MANUFACTURING CO., ALEXANDER CITY, ALA.

Advanced engineering methods of servicing over 64,000 spindles at the mills of Russell Mfg. Company have helped them to be recognized as one of the South's most enterprising textile mills. The continuous productive operation of textile machinery depends to a large extent upon keeping the equipment supplied with work materials. Keeping work material on hand and feeding it into the spinning machinery speedily is accomplished at Russell Mills with a combination of integrated trucks. And to assure these trucks a trouble-free, continuous cycle through every phase of mill operation, the Russell executives selected Faultless 504-4TG rigid plate and 1104-4TG Double Ball Bearing Swivel Casters with drawn steel wheels.

*1100 Series SwivelCaster shown with Drawn Steel Wheel. Note two full rows of hardened ball bearings in swivel head and in wheel hub.*

*500 Series with Plaskite Wheel and Thread Guard to keep lint out of bearings, string from winding around axle.*

Faultless castered equipment can lead the way to reduced costs and increased production in *your own plant.* Casters for light, medium, heavy and special duties are included in the extensive Faultless line. Faultless wheels for every type floor and load, as well as for special temperature and chemical conditions, are available.

**ASK YOUR DISTRIBUTOR**

Your nearby Faultless Industrial Distributor maintains a substantial inventory of Faultless Casters for immediate delivery. He and one of the strategically located Faultless Sales Engineers are available to work with you on every handling problem in your plant. Both are listed in the Yellow Pages of your phone book under "Casters," beneath the Faultless heading.

**Faultless Caster Corporation**

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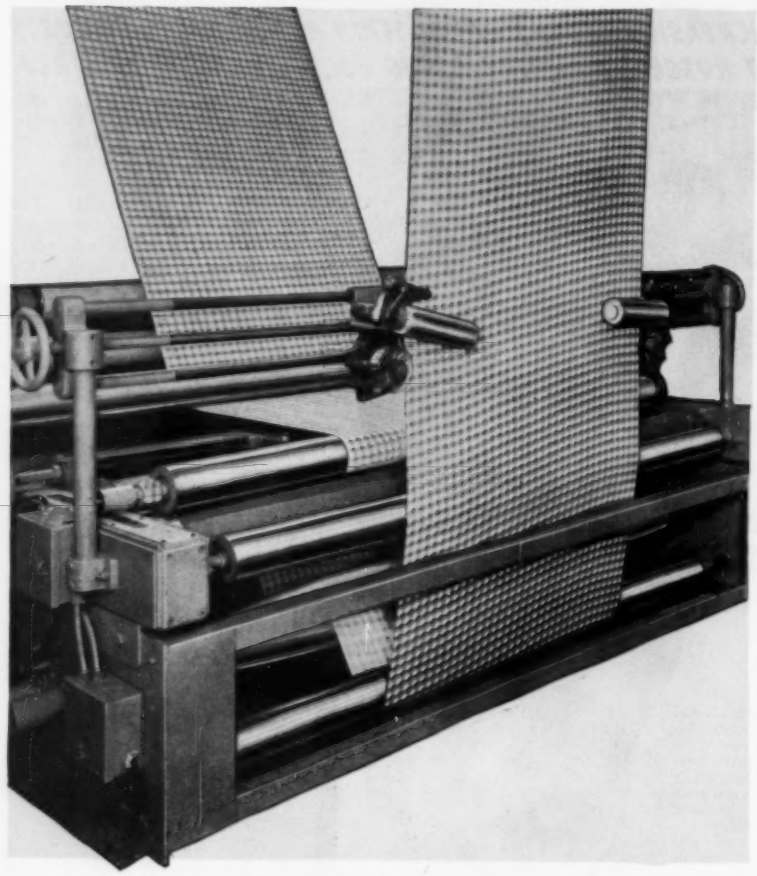

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direct reading tank gauges by Jordan Industrial Sales Div., OPW Corp. (F-34)

**Heat exchangers**—Details of design features and improvements in Bulletin 1.1K6 from Ross Heat-Exchanger Div., American Standard. (F-35)

**Automatic control package** — Data sheets available from Barber-Colman Co. (F-36)

**Solenoid-operated lubrication** — Fully described in Reference TR-57-E from Bijur Lubricating Corp. (F-37)

## GENERAL

**Photocopying**—Varied uses of photocopying in industry outlined in booklet from Business Photo Methods Div., Eastman Kodak Co. (F-38)

**Analyzers**—For almost every need are described in folders from Podbielniak, Inc. (F-39)

**Metal stitching**—A new idea in fastening is described in booklet from Acme Steel Co. (F-40)

**Industrial-truck electricity** — Fundamentals covered in bulletin from Exide Industrial Div., Electric Storage Battery Co. (F-41)

**Laboratory furniture**—And fixtures in unit form described in Bulletin FS-227 from Fisher Scientific. (F-42)

**Casters** — With phenolic wheels described in catalog from Darnell Corp. Ltd. (F-43)

**Electric trucks**—For narrow aisles described in Bulletin 201 from Raymond Corp. (F-44)

**Electric fork lift trucks**—Comparison chart for prospective buyers available from Lewis-Shepard Products, Inc. (F-45)

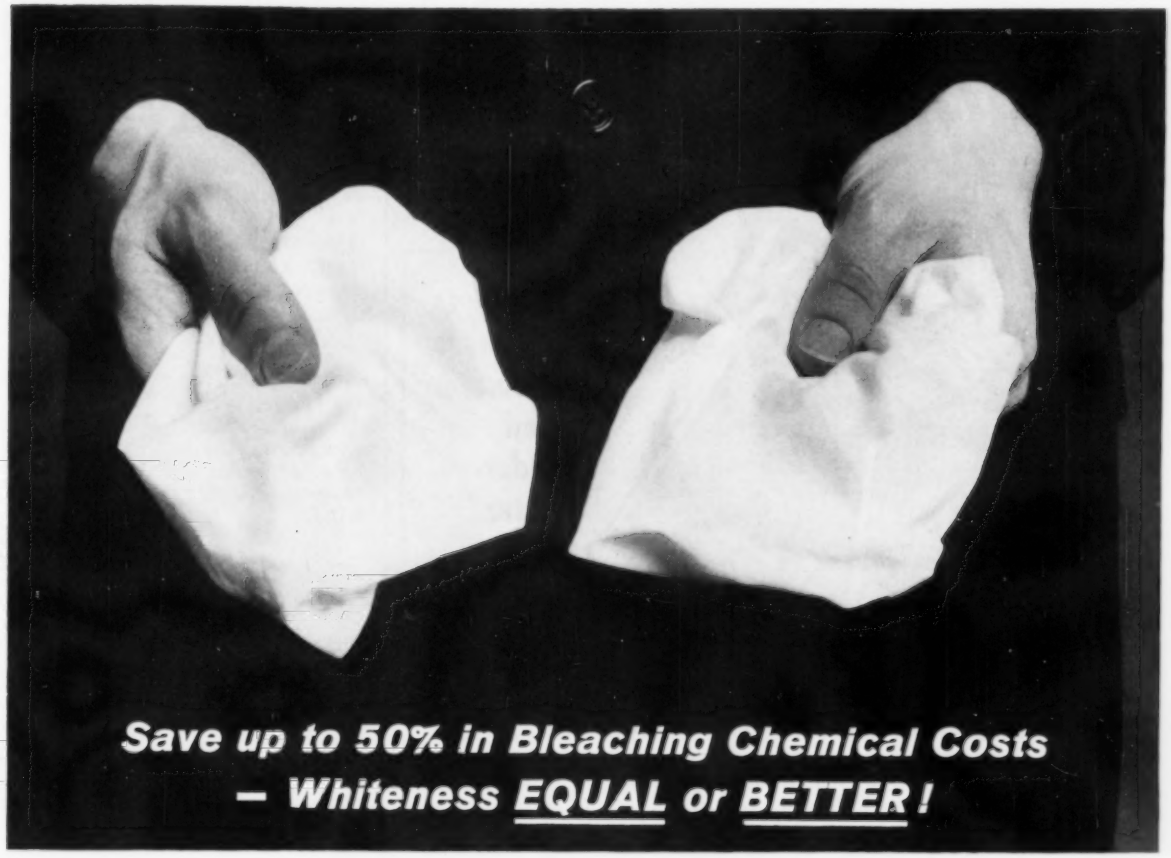
**Industrial heaters**—Described in Bulletin No. 750A from American Air Filter Co., Inc. (F-46)

**Textile casters**—Catalog and installation data from Faultless Caster Corp. (F-47)

**Power-strap feeder**—For feeding vertical straps around large packages described in folder from Signode Steel Strapping Co. (F-48)

**Lift truck**—Maintenance booklet issued by Towmotor Corp. (F-49)

**Overhead handling equipment**—Pictured and described in catalog issued by American Monorail Co. (F-50)

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By using the SOLVAY Activated Hydrogen Peroxide Bleaching Process for Cotton, you can save up to 50% in bleaching chemical costs and, at the same time, gain a number of measurable advantages.

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# Will it fade?

The question most frequently asked by consumers when buying soft goods. "Will it fade?" is even ahead of "What is it made of?"—"How much does it cost?"—or "Who manufactures it?"

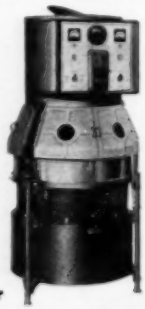
A nation wide survey made by the American Cyanamid Company of over 33,000 buyers and merchandise managers in department and specialty stores reveals this consumer attitude about color stability.

The seriousness of the problem of color failure is disclosed in the returns showing that color fading, running or rubbing off, brings merchandise returns to over 83% of the stores reporting. Among the worst areas are curtains, draperies and upholstery, say 38.64% of store respondents; dresses, 39%; blouses, skirts, sportswear, 31%; knitwear, 27.5%; slip covers, bedspreads, 27%; sport shirts, 23.6%; corduroy products, 20%; pajamas, 18%.

Atlas Fade-Ometers and Launder-Ometers permit accurate and dependable assessment of the degree of color fastness to light, washing and bleeding. Standard methods of test and of reporting results enable the manufacturer to provide guarantees which are recognized and understood by both buyer and seller.

Producers of soft goods who can advertise and sell their product as having a specific colorfastness rating have a price advantage over merchandise marketed without the color stability assurance provided by these Atlas Ometers.

Atlas Launder-Ometer


Atlas Fade-Ometer

**ATLAS ELECTRIC DEVICES CO.**

**4114 N. Ravenswood Ave., Chicago 13, Ill., U. S. A.**

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**MANAGEMENT ACCOUNTING FOR COST CONTROL,** by I. Wayne Keller; McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y.; 435 pages, $7.

This book covers not only cost accounting but also budgetary planning and control. Cost-accounting procedures, how to develop and use standard costs, and how to control costs and handle capital are explained fully.

The business of cost finding is also correlated with the factors involved in setting up satisfactory sales prices. How to prepare reports on costs and budgets for top-echelon management is shown.

The book should be valuable to any one in industry, from foreman to management, who is concerned with cost control.

**TEXTILES (ARTS & CRAFTS OF JAPAN),** by Tomoyuki Yamanobe: English adaptation by Lynn Katoh; Charles E. Tuttle Co., Rutland, Vermont, and Tokyo, Japan; 70 pages, $3.

Japan's textile industry can be traced back to the beginning of the Christian era and started with coarse fiber. Later, about 200 A.D., records show that silk weaving was introduced through Chinese immigrants. By 550 A.D., the arts of weaving and coloring silk were well developed.

Mr. Yamanobe, in this volume, traces the history of the development of the characteristic Japanese styles of decoration through the principal periods of growth to the present day.

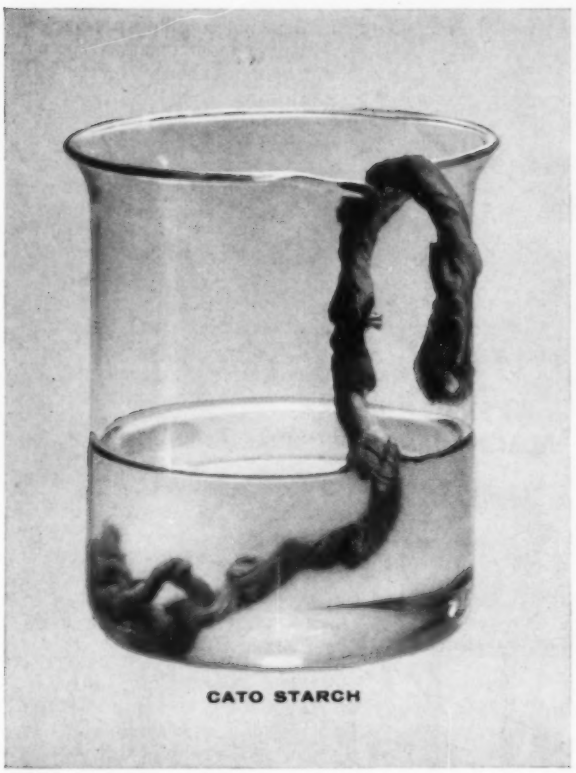
Excellent color plates and black-and-white reproductions illustrate the text.

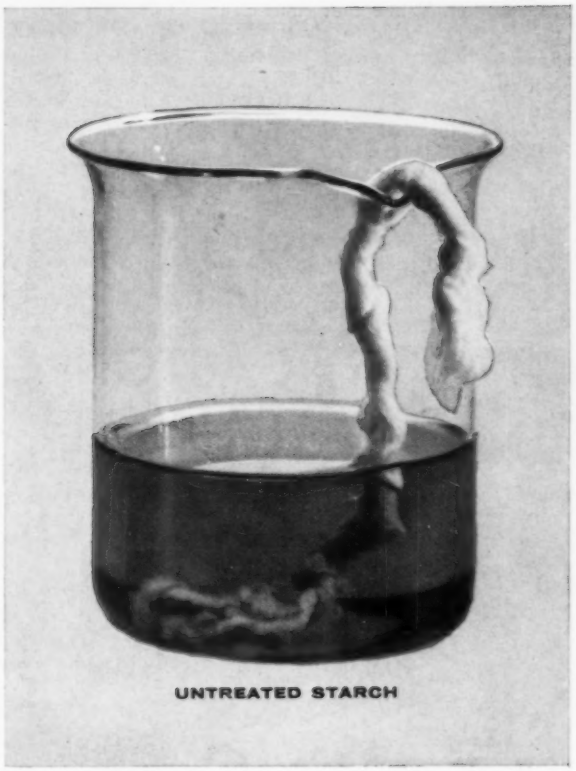
Japanese artisans produced beautiful designs in brilliant colors by means of tie dyeing, hand painting, stencil dyeing, and a form of resist dyeing that still relied on hand application of color in patterns until late in the 19th century. The more recent work is mechanized and lacking in originality.

Comments accompanying the illustrations provide interesting historical data on how the styles and effects were produced.

# CATO®

CATIONIC STARCH FOR WARP SIZING




## IODINE TEST proves greater starch affinity

A simple experiment. Take 100 ml. of solutions of Cato and corn starch at 0.005% concentration. To each add a 1 gram strand of any anionic yarn: cotton, wool, viscose, dacron, or others including blends. Boil for a few minutes. Cool and allow strands to drain as shown above. Now add drops of iodine to the strands and their respective solutions.

What happens?

The blue of the iodine test for starch proves the much greater affinity of Cato to anionic yarns—due to its patented cationic molecular structure. Showing how Cato promotes better adhesion, reduces shedding and improves weaving in warp sizing.

Interested? We'll be glad to supply trial quantities and have one of our textile specialists demonstrate in your plant.

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CONTINUED FROM PAGE 96

skip must be included in the shuttle box motion. When four shuttles are used, it is advisable to use the 1-2-3-4-3-2 sequence because a double box skip may cause trouble. There are any number of variations, but these are the common box motions used in most woolen mills.

### Three Shuttles Mix Filling Best

A 4x2 shuttle-mixing loom is probably the best automatic loom to weave this fabric. The filling is mixed by using three shuttles running in rotation picking a single pick from each of the three shuttles. This action mixes the filling thoroughly and helps prevent uneven or shady places in the woven fabric.

This method is commonly referred to as running the shuttle on a merry-go-round and could formerly be used only on a 4x4 hand-fed loom. The filling had to be changed manually by the weaver. In weaving contrasting colored fabric on hand-fed looms, five, and sometimes seven, shuttles were used to mix the filling.

A woolen loom using a 10½-in. filling bobbin will run with fewer filling doffs. The bigger filling package will also help in loom operation because fewer bobbin changes lessen the chance of bad doffs, side lines, and other conditions sometimes caused by a filling change. A long bobbin will help reduce waste because there must be a reserve or bunch wound on the bobbin for automatic loom operation.

Filling yarn must be even and not vary from bobbin to bobbin. Uneven dyeing or mixed dye lots are certain to cause trouble. Each mixture or dye lot must be kept separate. Lot changes must be made at the cut mark. Marking lot changes with chalk will help keep them from being mixed.

All employees coming in contact with filling yarn should be told about the importance of keeping the lots separate. A system should be set up so that a weaver cannot start a new cut unless there is enough filling of the same lot on hand to weave out the next cut.

### Lot Run-Outs Cause Remnants

Serious trouble can result from a number of looms running out of a lot of filling with cut marks in various stages of fullness. Changing lots other than at cut marks will surely cause a change in the appearance of the fabric. At the finish examination, the cloth will have to be cut at the changes, which causes an excessive number of remnants and short cuts.

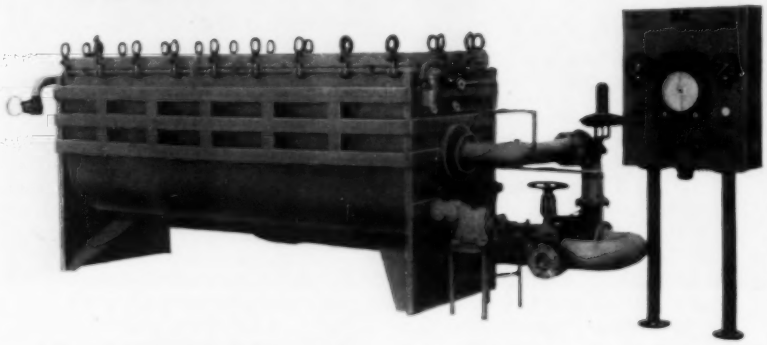
Light and heavy places caused by uneven weaving are also conditions that must be given special attention. Supervisors should be certain that loomfixers, weavers, and other weaveroom personnel are alerted to the fact that any slight unevenness in weaving will cause an imperfection in weaving contrasting colored tweed-type fabrics.

Before putting in a warp, the loom should be checked to see that the let-off and take-up motion are in perfect condition. When the warp is lifted into the loom, make certain that the beam turns freely and does not rub against the whiproll or loom frame.

The condition of the take-up roll should be checked. If perforated steel covering is used, make certain that the covering has been installed so that the pull of the pin holes is downward. The difference can be easily determined by running the hand on the steel covering. In one direction it will pull, and on the other direction only roughness will be felt.

Nonautomatic let-offs depend on friction produced by the beam bands around the beam flanges. The amount


NEW GASTON COUNTY TRICOT DYEING MACHINES



HIGH TEMPERATURE

Developed primarily for dyeing tricot knitted fabrics, wound on perforated dye beams, at temperatures above the boiling point, this machine can also be used for dyeing at conventional temperatures below boiling. For the latter, lid may be removed or left in place.

Available for cloth 120" wide, up to 2,000 yards in length. Has been used successfully for dyeing woven as well as knitted fabrics.

Also available—open-type machine for dyeing open-width woven or knitted fabrics, laces, marquisettes and open-weave cloth, up to 72" wide and 8,000 yards in length.

OUTSTANDING NEW FEATURES

COMPLETELY AUTOMATIC FLOW CONTROL—Flow control valve is always closed when dye pump is not running. Desired dyeing pressure is pre-set on control panel, pump is started and pressure is then maintained at set point throughout the entire dyeing cycle. Thus a constant flow without surges is assured.

AUTOMATIC BEAM REVOLVING DEVICE—The dye beam is revolved by a constant speed driving mechanism and this assures even penetration during the scouring and dyeing cycles. This feature minimizes shading and produces level dyeing from end to end of the dye beam.

ROLLER TYPE BEAM SUPPORTS—If the automatic revolving mechanism is not purchased the dye beam can be rotated manually in open-type machines.

GASTON COUNTY DYEING MACHINE CO.

*Pioneers in Automatically* *Controlled Dyeing Machines*

Stanley, North Carolina

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The Rudel Machinery Co., Ltd. 614 St. James St. W., Montreal 260 Fleet St. E., Toronto




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Gay cottons like the one above—as well as rayons and blends—have a special reason for that happy, carefree look they wear—they've been treated with RHONITE R-1. This modified urea formaldehyde resin is a monomeric product of such small molecular size that it penetrates and reacts inside textile fibers. That's why wash tubs won't worry fabrics treated with RHONITE R-1. And they just wink at wrinkles—only a touch of the iron and you'd think they were store-fresh.

Don't you think you ought to find out about treating your fabrics with RHONITE R-1? Why not write today?

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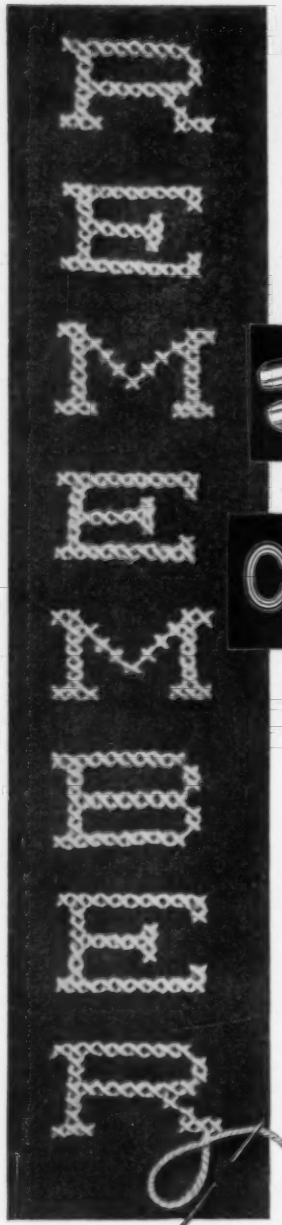
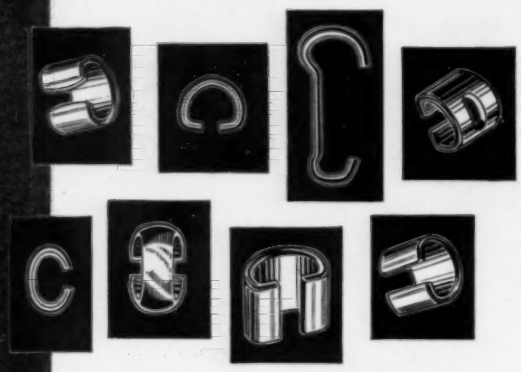



**Remember... when you think of Ring Travelers keep NATIONAL-STERLING in mind!**



**Let this remind you** of the **BIG** part travelers play in quality yarn production, and make a mental note to look into the *added* advantages of National-Sterling Ring Travelers.

**You'll find that National** Ring Travelers are completely uniform in weight, dimensions, temper and finish . . . that each traveler in each box is carefully made to meet your exact spinning or twisting requirements. Whether you're running synthetics, blends, or natural fibres, you can depend on National Travelers to deliver more pounds of first class yarn, at higher spindle speeds, with fewer ends down.

**Remember, too** . . . there's always an experienced National-Sterling Engineer nearby to help you select the *right* traveler for your particular operation. Call on him soon . . . he'll be glad to serve you! Write, wire or phone National Ring Traveler Company and Sterling Division, 354 Pine Street, Pawtucket, R. I. Southern Office and Warehouse: P.O. Box 293, Gaffney, S. C.

**NATIONAL Sterling RING TRAVELERS**

**F. L. CHASE, JR.,** *Pres. & Treas.* **L. E. TAYLOR,** *Southern Mgr.*

FOR SPINNING AND TWISTING ALL NATURAL AND SYNTHETIC FIBRES

**There's a NATIONAL man nearby!**

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Export Agent: **A. M. ROMERO CORP.,** 350 Fifth Ave., New York 1, N. Y.


of weights on the weight levers determines the friction produced. The usual practice is to use cloth between the bands around the beam flanges.

### Leader Cloth Makes Beam Band

On low-pick work, it is very important to use a soft-cloth beam band that will not glaze. A leader cloth that has been used in the fulling mill makes an excellent beam band. Make sure the cloth has been washed to remove any soap. If this type of cloth is not available, use any heavy soft woolen cloth that has been washed thoroughly.

Cover both sides of the cloth beam band lightly with flake graphite. This coating will help give a smooth let-off. Beam let-off weight must be regulated properly because weaving this type of cloth too tight or too loose will cause trouble.

Weavers must be sure to remove enough weights when the last cut is being woven. The smaller diameter of the beam causes the beam to let off at a faster rate. Too much weight at this time may cause the beam to release in a jerky manner, and this condition is sure to cause light and heavy places.

A check of records in one woolen mill showed that a high percentage of uneven cloth was produced on the last cut. Some mills make a practice of changing the cloth band at the middle and last cut of the warp.

The new-style fully automatic let-off with an auxiliary back roll does not require the removal of weights as the beam becomes smaller. After the proper amount of weights has been determined, the warp may be woven out with no change of weights.

Weavers must be cautioned in starting up after turning the head motion to make certain there are no light and heavy places.

---

## SOCK PRODUCTION

CONTINUED FROM PAGE 137

ules in red ink if the goods are to be shipped that same week. The time when the goods are delivered to the next section is entered on the schedule.

Boarding requirements are worked out to check how many men will be needed on the boarding machines or how many socks are to be stretched on cardboard shapes. Boarding times are taken from past experience and calculated along with the number of socks to pass through that day.

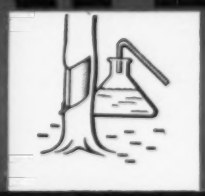
Girls in the finishing room don't

WHATEVER YOUR NEED, THINK FIRST OF

# NAUGATUCK

FOR

# LATEX



NATURAL OR SYNTHETIC RUBBER LATICES

PLASTIC RESIN LATICES

READY-TO-USE COMPOUNDS

## for your every textile application...

Whether you use latex for backsizing, saturating or coating—to increase strength, stability or stiffness—*there's a Naugatuck latex best for you*... either as a raw latex or compounded to meet your particular application.

Do you, for example, need a latex with minimum offshading effect on sensitive dyes? Do you require a latex that is stable to hot starch additives? Or one that can be extended with high filler loadings?

Perhaps your need is for a latex to lock pile, prevent weave slippage, impart dimensional stability, strength and resilience...or to up-grade your product's quality and hand. Whatever your need, *think first of Naugatuck for Latex!*

With more than three decades of formulating experience, featuring continuous research and application assistance, Naugatuck is one of the most experienced and exacting suppliers of latex and ready-to-use latex compounds to the textile industry. You can be sure of the care, skill and know-how that provides quality and uniformity in every Naugatuck latex. They are all available to you through any of the District Offices listed below.

US RUBBER

**United States Rubber**

**Naugatuck Chemical Division** 3381 Elm Street Naugatuck, Connecticut

Rubber Chemicals • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices

**DIST. OFFICES:** Akron • Boston • Gastonia • Chicago • Los Angeles • Memphis • New York • Phila. • **CANADA:** Latex Div., Dominion Rubber Co., Ltd., Montreal • **CABLE:** Rubexport, N.Y.



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Booth

*Originators of* **STRIP-O-MATIC**

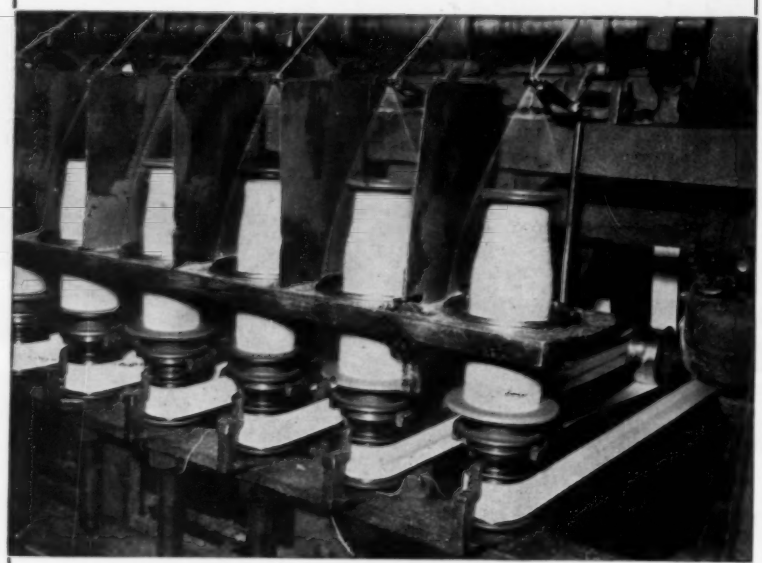
**CARD CLOTHING**

FIRST . . . . . **STRIP-O-MATIC**

SECOND . . . . . **SUPR-O-TAPE**

***Now...***

**SUPR-O-BAND**



SUPR-O-BAND, the new banding for spindle drives on spinning, twisting, and roving frames. Promises to be as successful as SUPR-O-TAPE that revolutionized woolen condensing "over night."

ALREADY PROVED by more than a year of rugged mill tests. Note these plus features:

- IMPROVED QUALITY
- LOWER POWER CONSUMPTION
- INCREASED PRODUCTION
- MORE ECONOMICAL

BECAUSE . . . SUPR-O-BANDS Give:

- OPTIMUM SPINDLE SPEED
- LONG LIFE
- UNIFORM TWIST
- MAXIMUM FRICTION—NO SLIPPAGE
- LOWEST COST

SUPR-O-BANDS are lint-free; use belt-hooks or stitching.

- STRIP-O-MATIC CARD CLOTHING
- CONVENTIONAL CARD CLOTHING
- SUPR-O-TAPE FOR CONDENSERS

**BENJAMIN BOOTH COMPANY**

ALLEGHENY & JANNEY STS., PHILA. 34, PA.

Booth

work to the rigid schedules practiced in the looping, clipping, dyeing, and boarding sections, where work is carried out until all the socks are processed for that day. All girls in the finishing room sit at individual tables and all face the same direction, which is the direction the work flows.

### Socks Move Smoothly

Socks are laid on bins at the left side of the line, and a supervisor keeps these goods moving smoothly. Each lot is checked off the original order form as it reaches the end of the line. The lots are accumulated until the whole order is complete.

If a snag occurs during production, the required socks are knitted and finished immediately to complete the lot. The office girl is notified, and the goods are transferred to the following day's schedule.

A box list is made out the week before the socks are knitted to make sure that the finished goods are not held up for labels, boxes, or tickets. A shipping list is made out each day, and the shipping labels and bills are delivered from the office each day with this list.

The weekly schedules are worked out during the week end; so a fresh start is made in the knitting room on Monday. From the knitting room, the work flows quickly through other operations with a minimum of supervision.

---

## DIVERSIFIES PRODUCTION

CONTINUED FROM PAGE 89

and empty beams can be raised with a chain hoist and transported to any part of the room or to and from trucks at the mill door. Warp tying is done with 36-in. portable tying machines.

Piedmont is still in the duck business—it has a steady market for a limited quantity of belting, hose, and numbered duck—but it will not be dependent on the uncertain duck market for future business.

With its more versatile weaving setup, the mill can produce any type of plain ply-yarn fabric in widths to 60 ins. and in weights of from 6 to 36 oz. per sq. yd.

### Other Fabrics Are Also Made

In addition to duck, the mill is already producing some rug backing and filter fabrics. It is also running some experimental lots of many other fabrics, including some of man-made fibers and wool.

When some of its looms were cur-

# Dixie Bearings, Inc.

## the maintenance man's friend . . . through service!

Dirt . . . the most feared enemy of any good anti-friction bearing was damaging many bearings in the maintenance stock at this foundry. Our salesman was called and within a short time reorganized their maintenance stocks of bearings and developed a more practical record keeping system.

First—all bearings in stock long enough to be affected by foundry dust were taken to our branch. There, they were thoroughly cleaned, rewrapped and repackaged to be as dustproof as possible.

Second—all bearings in use in the foundry were identified by our salesman according to the bearing manufacturers' numbers. By converting the equipment manufacturers' parts numbers to standard bearing numbers, many bearings purchased from various sources under a variety of parts numbers were found to be identical.

Weeding out these duplicates greatly reduced our customer's purchases for inventory. We now know what bearings the foundry uses and make certain stocks for any emergency are carried at our branch. Our customer now installs only factory-fresh bearings from inventory or orders from Dixie Bearings and receives the bearings they need immediately.

Need this kind of service—service with a capital "S"? Just call our nearest branch—no obligation, of course.

*Providing bearing service in the South* ➤ **DIXIE BEARINGS, INC.**

**FLORIDA:** Jacksonville • **GEORGIA:** Atlanta • **KENTUCKY:** Louisville • **LOUISIANA:** Baton Rouge • New Orleans
**N. CAROLINA:** Charlotte • Greensboro • **S. CAROLINA:** Greenville • **TENNESSEE:** Chattanooga • Kingsport • Knoxville • Nashville

*and*

*in the North* ➤ **BEARINGS, INC.**

**OHIO:** Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Lockland • Mansfield • Toledo • Youngstown • Zanesville
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**WEST VIRGINIA:** Charleston • Huntington • Parkersburg • Wheeling • **NEW JERSEY:** Camden
**NEW YORK:** Buffalo, Balanrol Corp. • **MARYLAND:** Baltimore • **DELAWARE:** Wilmington


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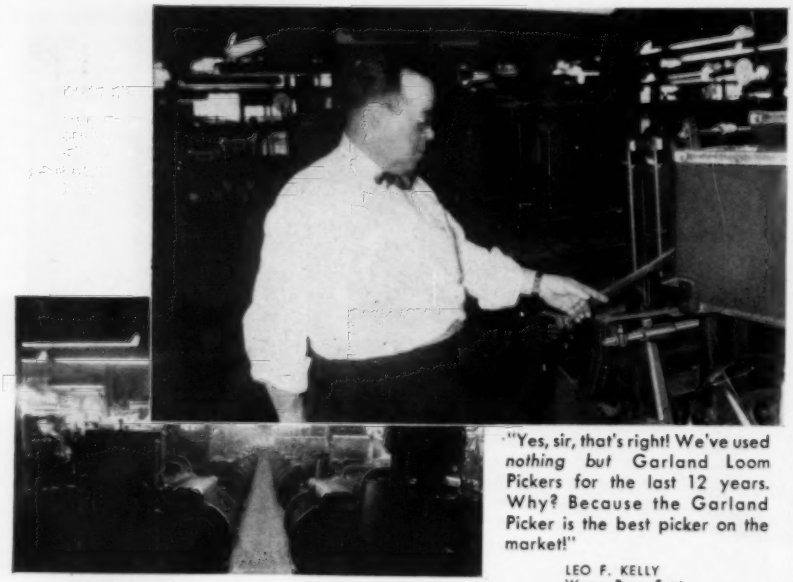
# TAKE A TIP...

## FROM MEN WHO KNOW LOOMS

## . . . and you'll find *NOTHING BUT*

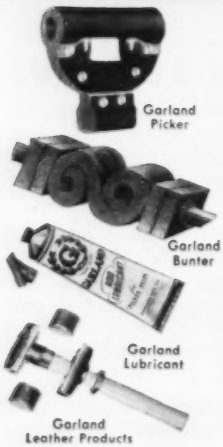
## GARLAND LOOM PICKERS

### at Livingston Worsted Mills



"Yes, sir, that's right! We've used *nothing but* Garland Loom Pickers for the last 12 years. Why? Because the Garland Picker is the best picker on the market!"

LEO F. KELLY
Weave Room Supt.
The Livingston Worsted Mills, Inc.
Holyoke, Massachusetts




The Livingston 70 loom (Crompton-Knowles W3) operation is typical of mills throughout the textile industry that depend on Garland rawhide pickers, sponge leather bunters, rod lubricant with applicator and Hair-on-loom Leathers.

Garland Pickers are number 1 choice because reinforced stick hole gives longer service . . . picker head is stronger, heavier . . . spindle hole is improved . . . and they are pressure molded from water Buffalo hide, the strongest material available, anywhere.

*Write for complete information on Garland textile products*

**Garland MANUFACTURING CO.**

*Manufacturers of* RAWHIDE LOOM PICKERS • SPONGE LEATHER BUNTERS • RAWHIDE HAMMERS AND MALLETS

**50 WATER STREET • SACO • MAINE**


tailed about four years ago, the mill changed some of its yarn production to tufting yarns, sales yarn, twine, and rope. It has built a good business in these lines.

With the resumption of full weaving capacity, the mill is increasing its yarn production. Additional wide-gauge, big-package, spinning frames are being installed to assure an adequate supply of yarn for its weaving, for end products, and for its yarn customers.

When the changes are completed, Piedmont Cotton Mills will be in a favorable position in a highly competitive field. Its versatility will enable it to take advantage of favorable market conditions for a wide range of textile products.

---

### ATTITUDE SURVEY

CONTINUED FROM PAGE 85

The response was gratifying. Many workers liked the company for reasons ranging from good working conditions to the annual barbecue, from the friendliness of officials to the absence of a union.

On the other hand, there was some criticism, much of it about favoritism on the job. Some helpful suggestions were submitted, although many of the suggestions were of a personal and selfish nature.

The company gained much valuable information from the survey, data that it could not have obtained otherwise. This information will be invaluable in planning the future personnel-relations policy.

The workers also benefitted. In addition to the changes in their favor that will result from the survey, they were given the opportunity to sound off. The boost to their morale when they realized that the company was interested in their likes and dislikes was great.

The company believes that the survey was well worth while for its psychological effect alone.

---

### 1957 COTTON

CONTINUED FROM PAGE 88

qualities of each new crop with the previous crop. But because of the unseasonable rainy weather in the Central states and Texas, the comparison is limited this year. Normally, the early-season pickings have the best fiber and spinning qualities, which become successively poorer for mid-season and late-season cotton.

In 1956, the grade index (Middling



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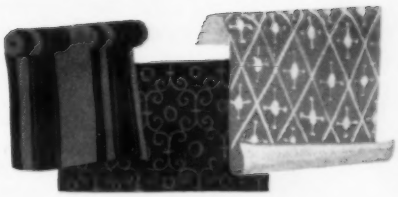
TEXTILE COATINGS FROM DOW

# For a better product at less cost try a Dow Latex

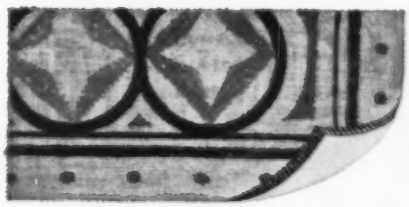


**FOR FABRIC WALL COVERINGS**

Coating with Dow Latexes effects excellent register, resulting in portrait quality, printability and embossability. Resistance to pastes, to soaps and other cleansers . . . excellent aging properties . . . all make the use of Dow Latexes even more desirable. Plan, too, for cost reductions!

**FOR RUBBERIZED HAIR PADS**

Blends of Dow Latexes with natural rubber or other binders tailor hair pads to fit every upholstery and packaging use. These latexes permit control of modulus . . . improve tensile strength and other properties . . . and effect savings in raw material costs.



**FOR RUG BACKING**

There is a Dow Latex to meet every formulating requirement. Sizes made with these latexes display a complete range of properties suitable for both woven and tufted products. Add hand, longer life and flexibility on aging with a Dow Latex.

WINDOW SHADES

DOOR PANELS

TRUNK LINERS

FABRICS

Dow Latexes are making important product improvements in these and other textile applications. Dow Coatings Technical Service is ready to help you solve your coating problems. Just drop a line to THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Dept. 2113B-1.

LATEX T.M.

YOU CAN DEPEND ON DOW



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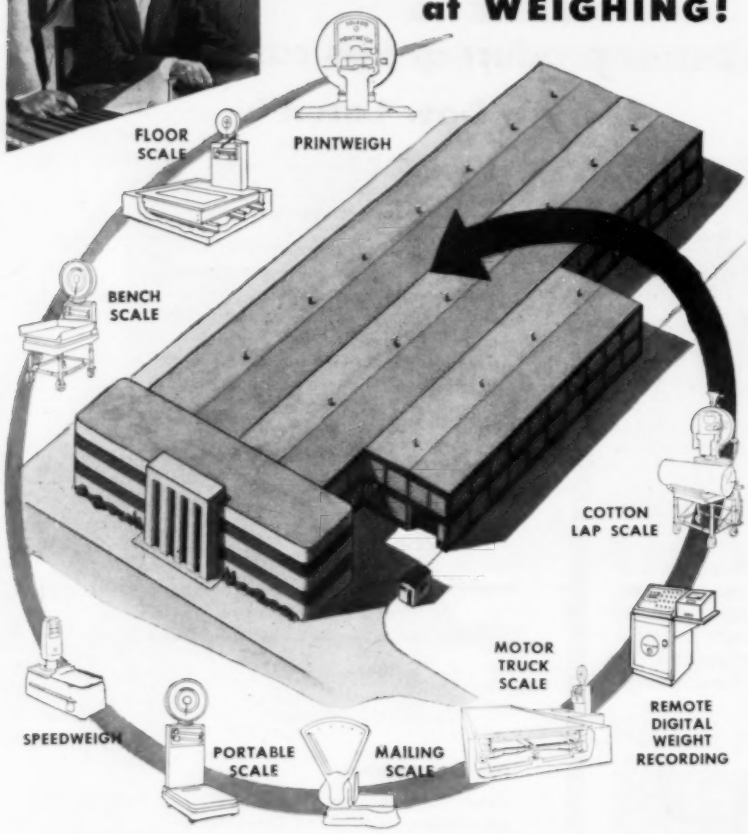
**Studying Costs? It pays to start with a**

# Plant-Wide Look at WEIGHING!




You can lessen the impact of rising costs by making sure your scales are doing the best possible job. Remember that weighing today is not a job for isolated scales—it's a vital element in your overall cost control system.

Weight records directly affect costs, quality, inventory control and customer billing. Weighing errors, or inadequate weight data, can be avoided by having the right scales in the right places . . . all carefully integrated in a plant-wide weighing system to supply basic records on materials received, shipped or transferred. Check your needs now! TOLEDO SCALE, Div. of Toledo Scale Corp., 1409 Telegraph Road, Toledo 13, Ohio.

**TOLEDO SCALE** *Headquarters for Weighing Systems*

DIVISION OF TOLEDO SCALE CORPORATION

☐ **NEW TOLEDO WEIGHT FACT KIT**

will help you determine how well your scales measure up as a weighing system—help you detect weighing losses that drain profits. Request your kit now. No obligation.

☐ Industrial Scale Line ☐ Electronic Load Cell Scales ☐ Motor Truck Scales ☐ Electronic Remote Digital Weights

☑ WE'LL BE GLAD TO MAIL THE LITERATURE YOU CHECK.


= 100) for the total crop of Upland cotton dropped from 98 for the early-season samples to 96 for the mid-season and 93 for late-season samples. Associated with these grade decreases, picker and card waste increased from 7.9% for the early-season samples to 8.5% for the mid-season and 8.9% for the late-season samples. The decline in grade as the harvesting season progressed was reflected in lower color values for raw cotton and yarn.

As the season advanced, yarn strength became progressively lower; and the figures were related to the shorter staple lengths and lower fiber strengths. Increased neps in the card web, associated with increased fineness and lower fiber maturity, also were in evidence from early to late pickings.

Taking all of these factors into consideration, there will be a broader range of fiber qualities available in 1957 than has been the case for a long time. This condition is especially true in the Central states and Texas, where abnormal weather conditions prevailed during the main portion of the picking season.

---

## COTTON COST

CONTINUED FROM PAGE 139

original control fabric. No bad effects were observed in the running quality of the stock as it was processed.

As to the amount of leaf, trash, and motes that was taken out at the Axi-Flo cleaners, the figure increased 0.75% over the quantity that was coming out of the original opening line.

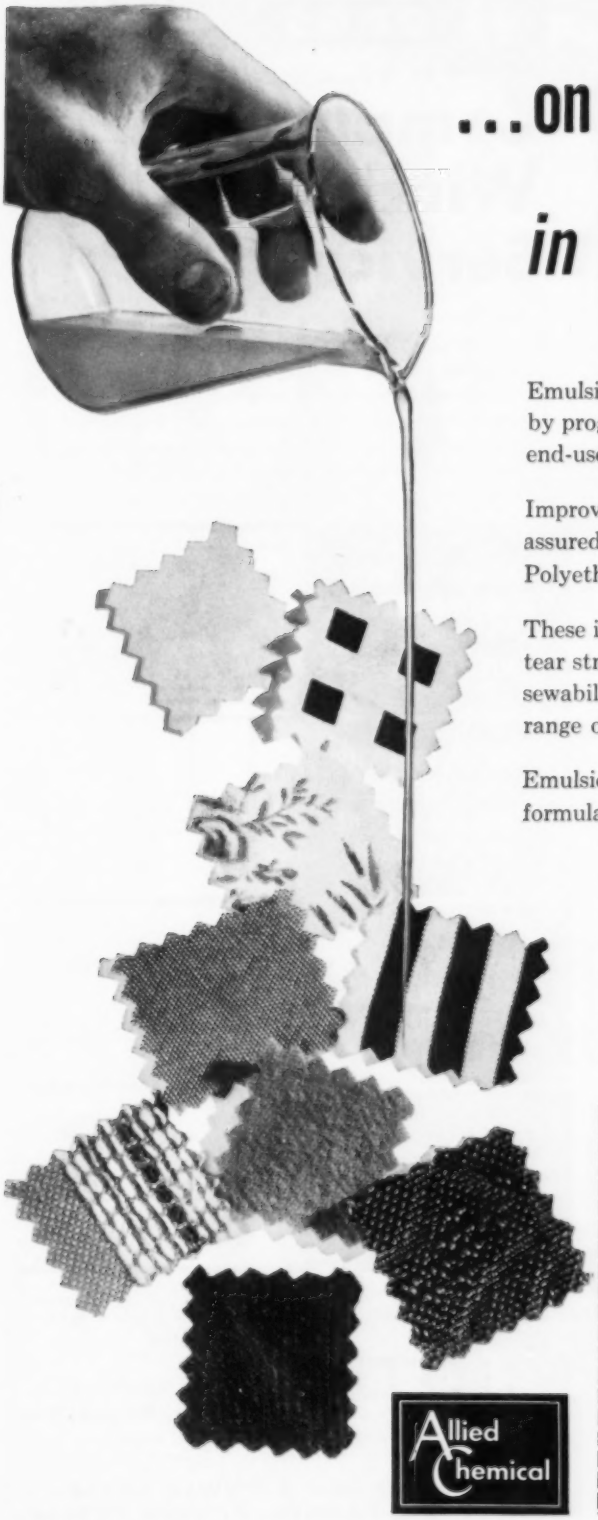
The opening line now in use at Gold-Tex is handling 1,600 to 1,800 lbs. of stock per hour successfully. This amount of stock may seem excessive, but the line does what it is intended to do and the results accomplished far outweigh the cost of the additional equipment.

### Check Your Opening Operation

While it probably will not be possible for everyone to accomplish savings by using a lower grade of cotton, as in this instance, it might be well for you to examine the equipment in your opening line to see what can be done toward making some type of improvement.

There is no doubt that considerable savings can be made today in raw materials, probably more than can be realized from the elimination of labor in a well-run, modern plant. The majority of plants already have eliminated most surplus labor and jobs, and there is very little left to cut out unless

# GOOD NEWS IS POURING IN



## ...on AC® Polyethylene in Textile Finishing!

Emulsifiable AC-Polyethylene 629 is now being used by progressive textile finishing plants for enhanced end-use fabric performance.

Improved and increased mechanical properties are assured when using Emulsions of this Polyethylene as a finishing agent.

These include: higher abrasion resistance, increased tear strength, reduced needle cutting, improved sewability, and better wash-wear finishes in a wide range of desirable hand properties.

Emulsions of AC-Polyethylene 629 properly formulated for textile uses will not retain chlorine; will not yellow whites; will not scorch at elevated temperatures; and will not affect dye shades or light fastness properties. Such emulsions are compatible with all common textile finishing agents.

Contact us for additional information on this new advance in textile finishing.

Allied Chemical

**SEMET-SOLVAY PETROCHEMICAL DIVISION**
Allied Chemical & Dye Corporation
Room No. 522-AH
40 Rector Street, New York 6, N. Y.

I am interested in AC-Polyethylene 629 for finishing_____

Name_____

Company_____

Address_____

City_____ Zone____ State_____



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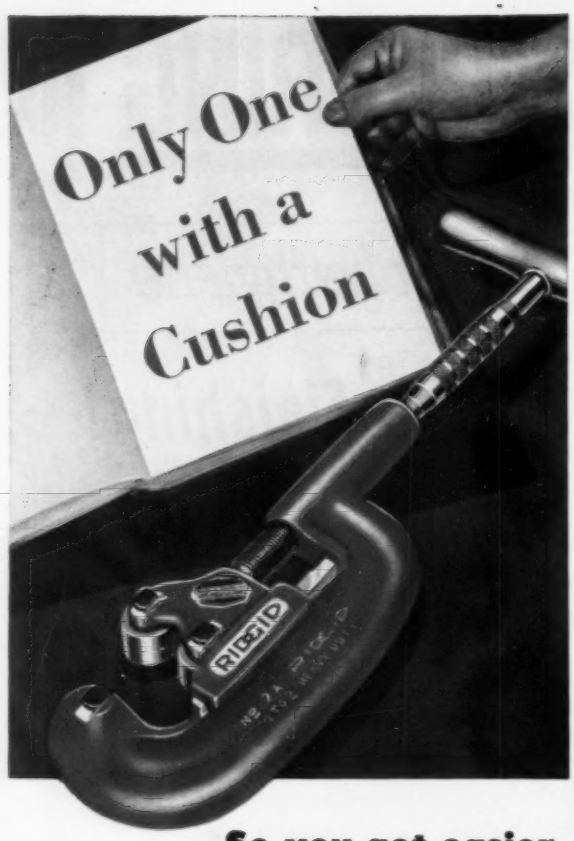


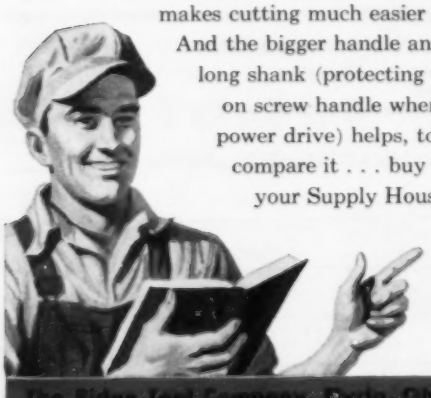

**So you get easier quicker action with**

*New*

# RIDGID

## Heavy-Duty Pipe Cutters

The instant you start feeding in this new cutter on a pipe you feel the remarkable difference, the new cushioning effect that makes cutting much easier and faster. And the bigger handle and extra long shank (protecting threads on screw handle when you use a power drive) helps, too. Try it, compare it . . . buy it at your Supply House.



The Ridge Tool Company, Elyria, Ohio, U. S. A.

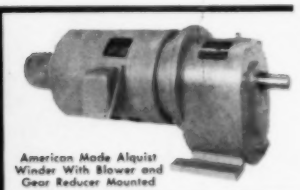
*At Last*

# HOBBS ONE STOP

## Complete Winding Service

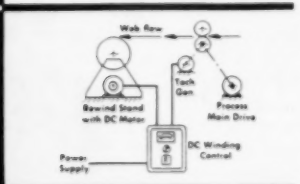
No more shopping around, no more fitting unrelated components together! Now you get one complete winding "package", all from one source — engineered, built and installed to your special requirements by the originators of "Engineered Winding". You save from the start and you *keep on saving* with a Hobbs Engineered Winding Package.

THE AMERICAN MADE STANDARD LINE OF HOBBS ALQUIST WINDERS

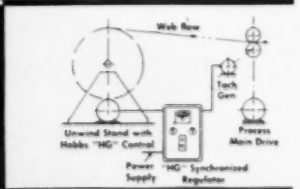


American Made Alquist Winder With Blower and Gear Reducer Mounted

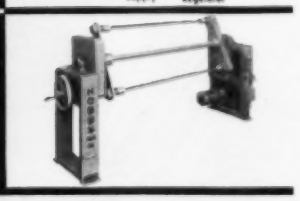
SPECIAL HOBBS WINDERS FOR FEED BACK CONTROL AND IN PROCESS SYNCHRONIZATION




HOBBS UNWIND UNITS FOR IN PROCESS SPEEDS OR 0 STARTS




HOBBS STANDS BUILT TO FIT YOUR WINDING OPERATION



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EST 1902
**60C Salisbury St., Worcester, Mass.**

Branch Offices and Representatives in Irvington, N. J., Chicago, Cleveland, Greenville, S. C. and Toronto, Canada

**WINDERS · HAND & POWER SHEARS**
**SLITTERS · DIE PRESSES · CORNER CUTTERS**



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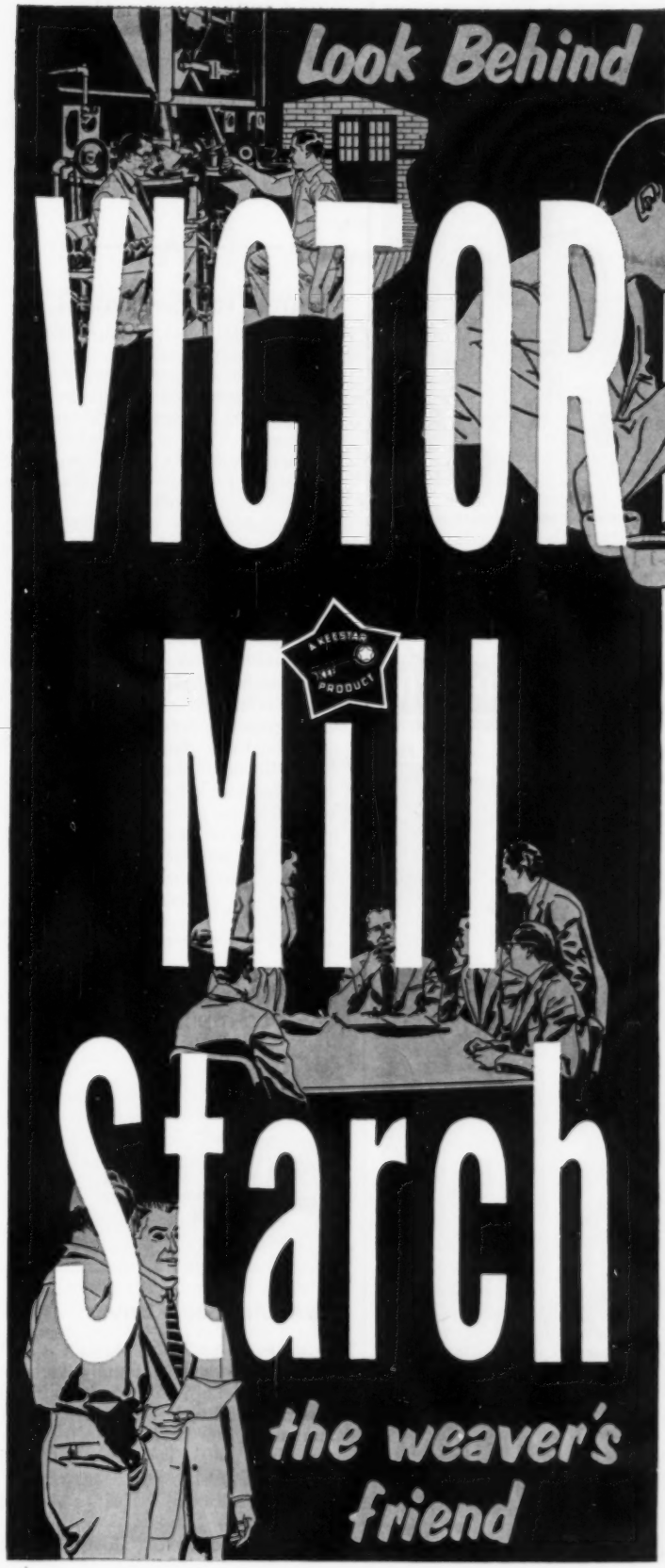


## Many Minds Are Better Than One

Keever sales-service men know the textile industry. As a trained specialist, each on his own can help you solve most common mill problems.

But the Keever man never works alone. Your success has built our business. That's why all customer problems are thoroughly discussed in staff meetings.

If an answer is hard to find, the combined contact experience of more than 120 years is focused on it – backed by top laboratory technicians in the Keever plant – and in the field.

**THE KEEVER STARCH CO.**
**General Offices – Columbus, Ohio**

Processors of corn, wheat and blended starches for industry since 1898

Charles C. Switzer, Vice President
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1300 S. C. NATIONAL BANK BLDG.
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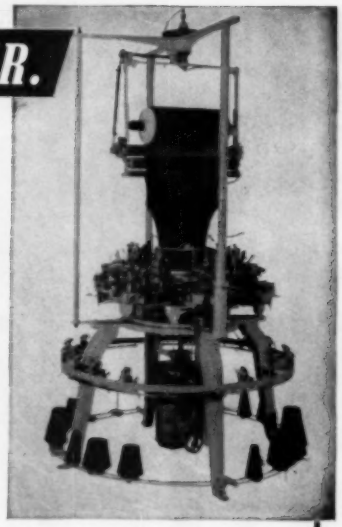
TOMPKINS S-1 JR.

MAKES THE MOST PERFECT CLOTH POSSIBLE



*HERE'S A TYPICAL EXAMPLE...*

Model S-1 Junior making fleece with 400-lbs. of Carter 26's and 8's —five feeds, 18" cylinder, running time 68-turns per minute . . .

- **MINIMUM OF IMPERFECTIONS AND BROKEN NEEDLES**

You can produce any class of cloth in the wide range of circular spring needle knitting—in greater quantity, with less waste and less needle breakage—on the New S-1 Junior! It gives you the proven Tompkins system in fully modern form . . . with triple stop motions, furnishing wheels, new gearless drive, automatic oiler and air cleaner! Get the full story now . . . be among the first to profit!

TOMPKINS BROS. CO.

623 ONEIDA ST. • SYRACUSE 4, N. Y.

*Makers of Circular Spring and Latch Needle Knitting Machinery...Since 1846*

PLEASING SYMMETRY plus SOUND ENGINEERING

• For three generations COLE has been supplying the textile industry with tanks they could *depend* on, from the conventional elevated tank to the modern type of storage reservoir shown above.

Take advantage of our 104 years of specialized knowledge and experience in tank construction. Send us your inquiries for tanks of all types and capacities —stating capacity, height to bottom and location. Write for *Tank Talks.*

R. D. COLE MANUFACTURING CO.

*Established 1854*

NEWNAN, GEORGIA

R. D. COLE MANUFACTURING CO. COLE NEWNAN, GEORGIA

extensive changes are made in machinery.

In comparing the cost of machinery in cotton-textile plants today, opening equipment is among the most economical machinery in use in terms of the volume of stock it handles. Profits can be increased if savings are made by lowering the cost of cotton.

---

## POINTERS FOR SUPERVISORS

CONTINUED FROM PAGE 147

The theory that management training or a degree in psychology is a guarantee of good managing ability doesn't hold water. There is no substitute for experience, and no worker respects the judgment of a man who knows less than he does about his job.

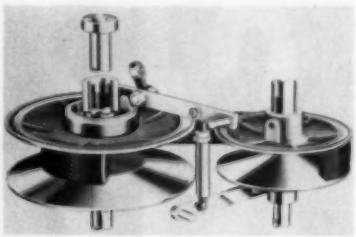
Remember that the simplest job requires some skill; and to many men on what might be called little jobs there is a certain pride of accomplishment in doing a simple, repetitive thing smoothly and efficiently. So don't minimize a man's importance and his self-respect, which are reflected in his job.

The young supervisor must bend every effort to get the interest and good will of the employees working for him. These intangible qualities that cannot be bought are given freely to a leader and withheld from the supervisor who ignores the human touch in his relations with his people.

---

## EQUIPMENT & SUPPLY NEWS

CONTINUED FROM PAGE 166



### Variable-Speed Drives

A line of mechanical variable-speed drives to provide infinitely variable speeds from 4,600 to 1.2 rpm. in speed variations of 2 to 1 to 10 to 1 has been announced by Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.

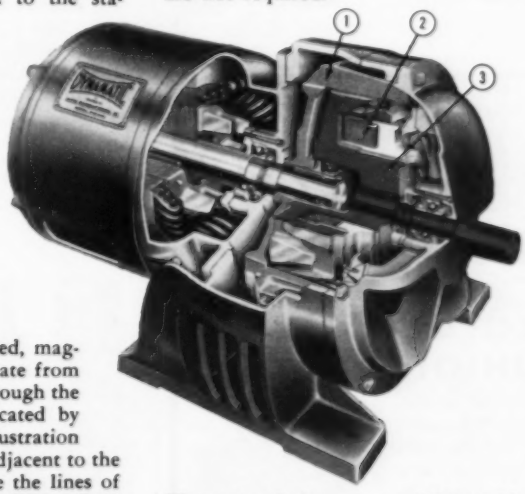
A special-ribbed V-belt and dual variable-pitch pulleys on parallel shafts give speed variation. Movement

# HOW DYNAMATIC® Drives Provide Infinitely Adjustable Speed with AC Power

Dynamatic Ajusto-Spede® and Dynaspede® Drives operate from an alternating current power source and are infinitely adjustable from zero RPM to full output speed. Accurate control of output speed is obtained by varying the current in a single field coil.

Each Dynamatic Drive consists of a constant speed AC motor and an eddy-current coupling. Torque developed in the motor is transmitted through the coupling by electromagnetic attraction between its driving and driven members.

The driving member, or drum (1), is mounted on the end of the motor shaft and surrounds the rotor, or driven member (3). The drum is free to rotate independently of the rotor until current is applied to the stationary field coil (2).



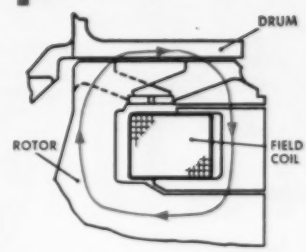

1. Input Drum Assembly
2. Stationary Field Assembly
3. Output Rotor Assembly

As the field coil is excited, magnetic lines of force emanate from the field coil and flow through the rotor and drum as indicated by arrows in cross-section illustration (A). Poles on the rotor adjacent to the smooth drum concentrate the lines of force into localized areas of "high flux" density in the drum's inner surface, shown in illustration (B). As the drum rotates about the rotor, these high flux areas sweep the inner surface of the drum, causing a variation of flux density that generates an eddy-current field in the drum's inner surface. Magnetic attraction between this eddy-current field and the rotor poles causes the rotor to rotate with the drum.

The torque transmitted from the drum to the rotor varies with the current applied to the field coil and with the "slip", or difference in speeds between the drum and rotor. Speed control with eddy-current equipment is obtained with a control system that adjusts field coil current to deliver the required torque at the desired slip.

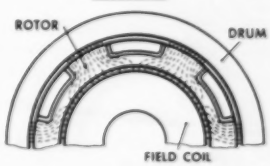
The control systems used with Dynamatic Eddy-Current Equipment operate on alternating current and require no special power source. Because of the low power required for field coil excitation, rectifying of field coil current is easily accomplished electronically. Expensive motor-generator sets are not required.

The control features available with Dynamatic Eddy-Current Equipment include constant speed regulation, acceleration control, torque regulation, cascading of multiple units, inching and threading, and numerous others as required by individual applications. Dynamatic Eddy-Current Equipment is ideally suited to automatic control.



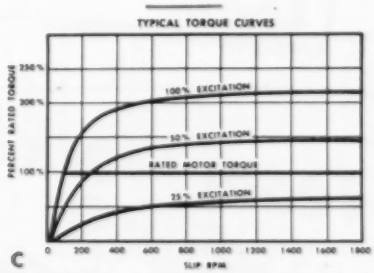

A

**Flow of magnetic lines of force through rotor, drum, and stationary field.**



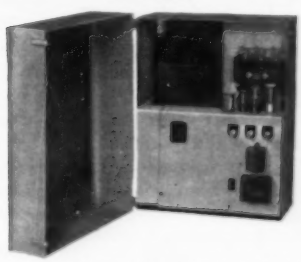

B

**Concentration of magnetic lines of force by the rotor poles.**




C

**Typical torque curves show torque at various values of excitation. The horizontal line is rated motor torque.**



D

**The electronic control systems used with Dynamatic Eddy-Current Equipment do not require a special power source or motor-generator sets.**

*Send for your copy of Bulletin D-582 which gives detailed information on Dynamatic Eddy-Current Equipment.*

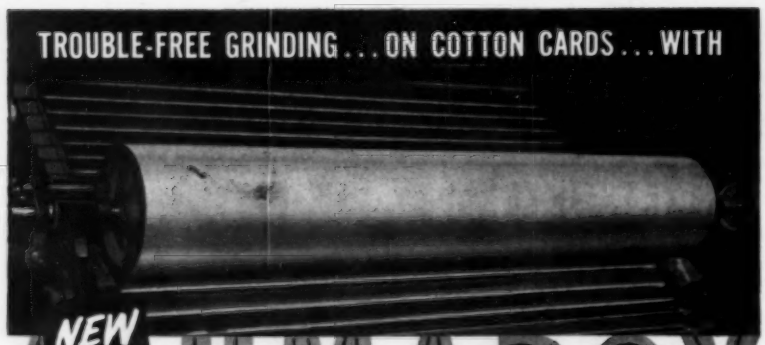
EATON®

**EATON** DYNAMATIC DIVISION MANUFACTURING COMPANY CLEVELAND, OHIO



For more data, write this page number on Reader-Service card. →

TROUBLE-FREE GRINDING... ON COTTON CARDS... WITH



NEW ALUMAROY DRUM GRINDERS

B. S. Roy's latest development . . . an aluminum alloy drum grinder . . . weighs only half that of steel or cast iron models.

This lightweight grinding roll eliminates springing of the top flats caused by the heavier drums and assures even, perfect grinding over the entire surface of each working flat.

For savings on Card clothing . . . better card settings . . . lower maintenance and repair costs, get full details on "ALUMAROY".

"BALANCED" ROY GRINDERS

B. S. ROY & SON COMPANY

*Southern Office and Plant*
Linwood at Second Ave.
Gastonia, N. C.
Telephone Gastonia UN 4-2126

Team Work!

ROTARY UNION

Trade Name — Patented

*When used alone,* both the Unitrap (steam trap) and the Rotary Union (rotating joint) greatly improve steam line performance. The Unitrap's trigger action and tremendous capacity automatically deliver peak efficiency at all pressures from 0 to 250 lbs. without changes or adjustments. The self-adjusting and self-aligning precision mechanical seal of the Rotary Union assures a positive rotating seal which outlasts all others.

*When used together,* these fine PSC units give you the ultimate in performance and economy. Try this team on your slashers, dry cans, calenders, embossers, etc. and you'll be convinced. Ask for Bulletins 800 and 700.

"WHERE *Good Connections* COUNT"®

Unitrap*

* Reg. Trade Name

PERFECTING SERVICE COMPANY, 332 Atando Ave., Charlotte, N.C.
Baltimore—Buffalo—Camden, N. J.—Chicago—Cleveland—Los Angeles
New York—Providence—Hamilton, Ont.—Montreal—Toronto

of the pulleys is synchronized by a positive pulley control that can be adapted to manual, semiautomatic, or automatic controls.

These units are available in two basic constructions: (1) integral motor construction where the motor is an integral part of the case and (2) separate motor construction where the motor is mounted on a separate platform and is coupled directly to the variable-speed transmission.

**Circle T-29 on Reader-Service Card**

## Fluorescent Lamp

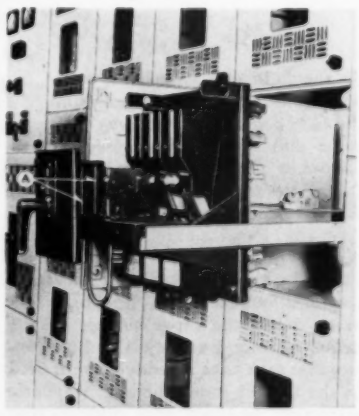
A 40-w. fluorescent lamp with 9% greater lamp output than its 40-w. standard cool-white lamp has been announced by General Electric Co., Large Lamp Dept., Nela Park, Cleveland 12, Ohio.

The initial lumen output of the lamp has been raised from 2,500 to 2,650 lumens in both the preheat and rapid-start models.

Maintenance of light over the life of the lamp has been improved also; at 40% of the rated life, for instance, the light output is 2,350 lumens in the preheat model and 2,400 in the rapid-start lamp. Formerly the light output at this point was 2,000 lumens for both lamps.

The output of other white fluorescent lamps is expected to be boosted soon by this same production process.

**Circle T-30 on Reader-Service Card**



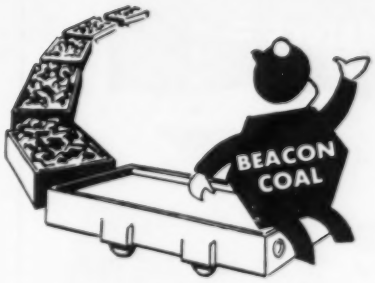
## Air Circuit Breaker

A metal-enclosed switchgear with three-position-breaker design is now available from Westinghouse Electric Corp., P. O. Box 2099, Pittsburgh, Pa. The switchgear, Type DB, is for 600 v., 15 to 4,000 amps.; and the

# Our product—plus our services—bring you something EXTRA in filling your fuel needs

## RESEARCH

We maintain a modern research laboratory, and verify laboratory findings in actual plant operations




## CAPACITY

Our annual tonnage of about 18,000,000 includes a wide variety of coals with a complete range of analyses

## PREPARATION FACILITIES

Modern, up-to-date preparation equipment and careful inspection insure uniformity of product

## TRAINED TECHNICAL REPRESENTATIVES

Our representatives are trained combustion and carbonization men, who can understand your needs, and work intelligently to meet them

## TELETYPE SERVICES

Inquiries, placing and expediting of orders, and information on shipments are all handled promptly and completely over our widespread Teletype network

## TIMETABLED SHIPMENTS

Our capacity permits us to meet tonnage requirements of the largest user, and our shipping facilities let us adhere to the strictest timetable on deliveries

EASTERN GAS AND FUEL ASSOCIATES
BEACON COAL

## EASTERN GAS AND FUEL ASSOCIATES

Pittsburgh • Boston • Cleveland • Detroit • New York • Norfolk • Philadelphia • Syracuse

**FOR NEW ENGLAND: NEW ENGLAND COAL & COKE CO.**
**FOR EXPORT: CASTNER, CURRAN & BULLITT, INC.**



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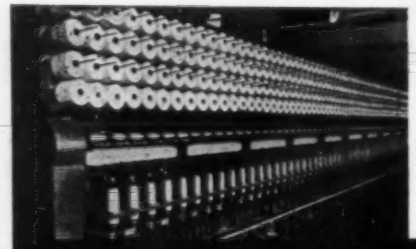


Tops for Cotton Tire Cord Paper

**COLLINS Big Ring Twisters =**

Collins Big Ring Twisters produce 4 to 12 lb. packages of exceptionally clean knotless yarns, when employing a 6 to 8 in. ring size.

*High Speeds* are possible because Collins Big Ring Twisters are equipped with large diameter pulleys, anti-friction idlers, ball bearing front roller stands, large diameter feed rolls, and roller bearing spindles.

*Low Cost* is achieved through increased twisting and winding efficiency. *Quality* is inherent in big packages of knotless yarns. Write for full information on Collins Big Ring Twisters and Collins convenient financing plan.

**Big Packages Clean Knotless Yarn at Higher Speed ...Low Cost**

**COLLINS BROTHERS MACHINE COMPANY**

647 Roosevelt Ave., Pawtucket, R. I. • Charlotte • Chicago
Hugh Williams & Co. Ltd., 27 Wellington St. E., Toronto 1. Canada

*There is a Collins Twister for Every Ply Yarn Construction*



**AT YOUR SERVICE**

*

SPECIALIZED ENGINEERING
SPECIALIZED EXPERIENCE
SPECIALIZED MACHINERY
*FOR*
TWISTING • FORMING
STRANDING • BUNCHING
COTTON • JUTE • MANILA • SISAL
NYLON • DACRON • ORLON • SARAN
PAPER • POLYETHYLENE • GLASS

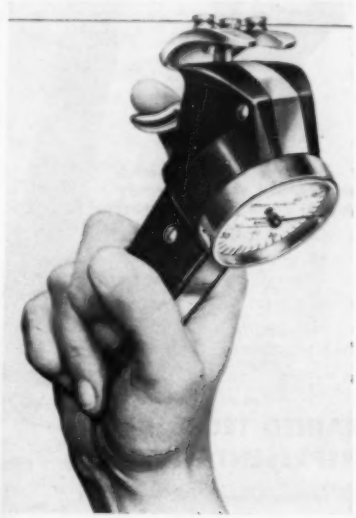
TEXTILE • WIRE • CORDAGE and OTHER INDUSTRIES

**HASKELL-DAWES**
MACHINE CO., INC.
2231 E. Ontario Street
Philadelphia 34, Pa.


units have an interrupting rating of 15,000 to 100,000 amps.

With the circuit breaker in any of its three positions of connected, test, and disconnected, the door of the breaker compartment can be closed. Indication of the breaker position is provided by two white lines on the mechanism. This three-position feature offers convenience and safety to employees and greater protection for the circuit breaker.

**Circle T-31 on Reader-Service Card**



## Tension Meter

The Saxl tension meter, made by Tensitron, Inc., Harvard, Mass., features low deflection and negligible contraction of the yarn to be measured, which allows yarn-tension measurements of rubber strands to be made.

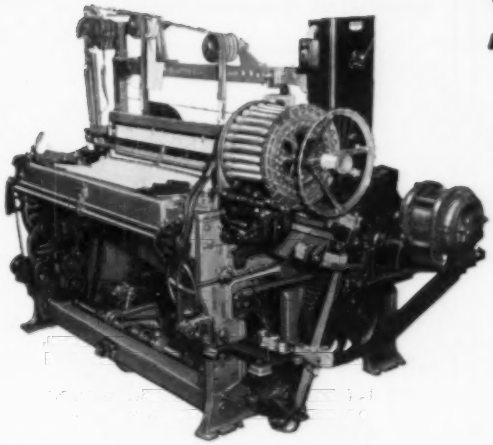
The tension meter has a trigger that is cocked like a gun to open the three-roll mechanism. The yarn is placed upon the two outer rolls, which are recessed into the plate so that the yarn cannot be caught in the pulleys.

When the trigger is released, the yarn automatically slips into the wheel grooves. The center roll deflects against the restraining of a calibrated spring of special construction. This motion is mechanically amplified over a gauge movement, and the tension is read off a dial.

The center roll is lifted a fraction of an inch and practically eliminates yarn contraction between the rolls. A transparent flywheel mounted on the pivot steadies the readings to give smooth averages of all conditions.

**Circle T-32 on Reader-Service Card**

CONTINUED ON PAGE 192



# Stehedco
## presents

## The REINFORCED
# DURAWELD
## PICKER STICK

**with this Unexcelled Combination . . . . .**
**Strength and Whip, plus Resistance to Warping**

**Here is another Stehedco *exclusive* . . . a picker stick that gives you advantages never before available.**

★ DURAWELD Picker Sticks are made of multiple laminated veneers of *high grade hickory* reinforced with veneers of vulcanized fiber, permanently bonded with phenolic adhesive into a uniform panel.

★ This construction gives DURAWELD Picker Sticks far *greater strength* while retaining the desired *"whip"* for high-speed looms.

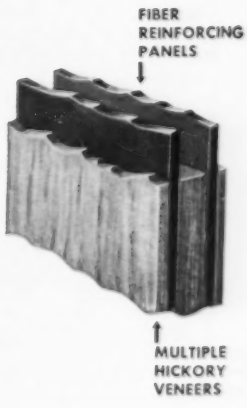
★ These laminated, reinforced picker sticks are much *less susceptible to warping* than ordinary picker sticks.

★ Stehedco DURAWELD Picker Sticks will pay for themselves many, many times with *superior performance* and *longer life.*

★ Designed for high-speed Draper looms, these picker sticks also give superior performance on slower single box and light multiple box looms.

★ The exposed, or nearly exposed, fiber at the picker end of the stick provides greater wear resistance to the lay end slot.

Invest in Reinforced DURAWELD Picker Sticks now and start counting your savings.

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**STEEL HEDDLE MFG. CO.**
PHILADELPHIA 32, PA.
**SOUTHERN SHUTTLE DIV.**
GREENVILLE, S.C.
Southern

P-5725

QUALITY Stehedco CONTROL

**Other Plants and Offices: Granby, Quebec, Canada—Lawrence, Mass.—Greensboro, N. C.—Atlanta, Ga.—Textile Supply Co., Dallas, Texas—Albert R. Breen, Chicago, Ill.**



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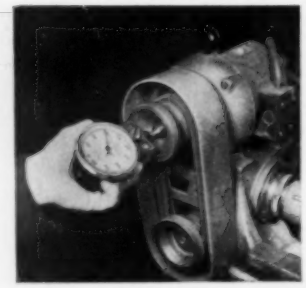
## Measure RPM's, FPM's and YPM's the precise way with a Jones Portable Hand Tachometer

**Continuous indication of speed with instant response**



An outstanding feature of this hand tachometer is that it accurately indicates the slightest fluctuation in speed. It operates on the centrifugal, mechanical principle. These Jones Tachometers are in use for checking the speeds of electric motors, plant machinery and equipment, generators, engines, pumps, conveyors and other variable speed apparatus.

**Many different models and speed ranges**

Jones Tachometers and Speed Indicators are available in many different models and cover a wide range of speeds. They are selected according to the application, which may be marine engines, diesel engines, railway locomotives, textile machinery, earth moving equipment, etc.

**Unaffected by temperature, humidity, electricity**

A feature of all Jones Tachometers is that they are unaffected by temperature, humidity, proximity to large electrical units or magnetic conditions. Also they operate in either direction of rotation and are accurate in any position, horizontal or vertical. They are furnished complete in carrying case with rubber tips and accessories. Write for Bulletin 146-4 or a demonstration to:

**JONES MOTROLA CORPORATION**

STAMFORD, CONNECTICUT



CHAPMAN . . . THE ORIGINAL ELECTRONIC STATIC ELIMINATOR . . . SINCE 1904

**CHAPMAN**

# STOPS STATIC

*Instantly & Completely*

SAFE TO USE • NO HARMFUL RAYS
OR GASES • LOW COST OPERATION
YEARS OF TROUBLE-FREE SERVICE
EASY TO INSTALL • INEXPENSIVE

A MODEL FOR
MOST EVERY
TEXTILE
STATIC PROBLEM!

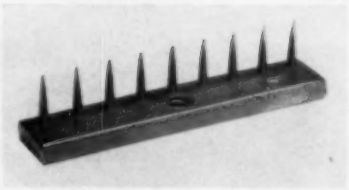
*The Portland Company* 28 FORE ST., PORTLAND, MAINE

WRITE FOR BULLETINS & DETAILS . . . . . *Now!*





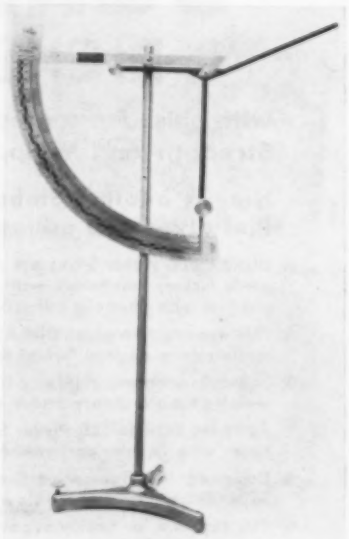
CONTINUED FROM PAGE 190

### Teflon-Coated Pin Clips

Teflon-coated base plates for pin clips are featured by W. H. Bagshaw, Inc., 70 Pine St., Nashua, N. H. The Teflon coating cuts down the accumulation of foreign matter on the base of the clips; so downtime for cleaning is very much reduced.

**Circle T-33 on Reader-Service Card**



### Yarn-Number Balance

A yarn-number balance introduced by Karl Frank GmbH, Weinheim-Birkenau, Germany, has a scale with two measuring ranges. One range is for metric yarn numbers and the other is for the Tex system.

The indicating hand is mounted on high-precision ball bearings to indicate accurate values. The Tex scale is divided into black and white fields corresponding to the application range of the rounded-off Tex numbers.

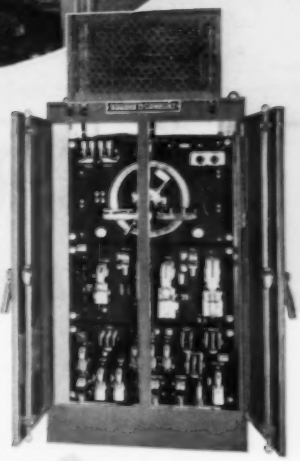
**Circle T-34 on Reader-Service Card**


CONTINUED ON PAGE 194

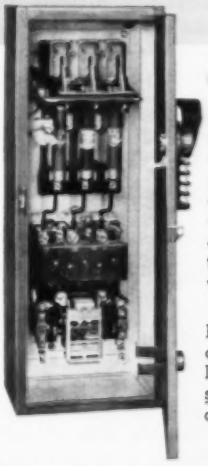
# SQUARE D
# DESIGN LEADERSHIP in TEXTILE CONTROL

**Shipper Rod Control Station** Flexible design permits conversion to either l.h. or r.h. operation, clockwise or counter clockwise rotation. Slotted operating arm for easy adjustment. Snap action contact mechanism.

**Loom Switch** Toggle operation with recessed handle. Protected type overload relays for group fusing. Accessible terminals. Available with line connections either top or bottom. Cover interlock with padlocking provision for maximum safety.

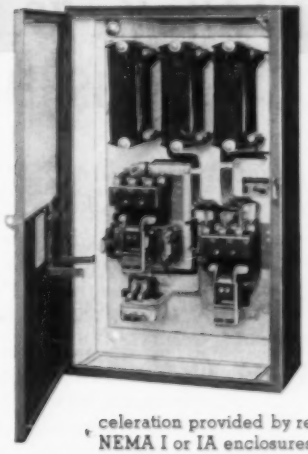


**Range Drive Control** Custom-built control for padder, tenter, winder, folder, pre-dryer, batcher machines, and other special textile machinery control applications.



**Combination Starter** New switch operating mechanism provides maximum safety. Interlock prevents opening door when disconnect is "ON" and self-aligning handle indicates true position of switch. Provision for 4 padlocks.

Fusible switch has visible blades; quick make and quick break; dead-front line terminals. Magnetic starter with guided motion of armature for long life.



**Roving Frame Starter** Primary resistor type. Definite time acceleration provided by reliable pneumatic timer. Available in NEMA I or IA enclosures.

**EC&M HEAVY INDUSTRY ELECTRICAL EQUIPMENT...NOW A PART OF THE SQUARE D LINE**

**SQUARE D COMPANY**



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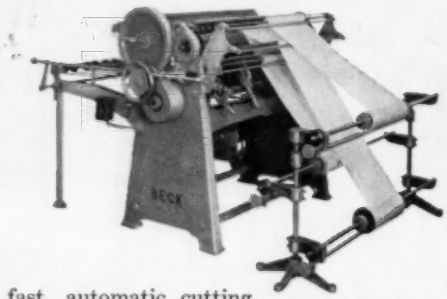
The *MODERN* way to
cutting-room *PROFITS*

The **BECK**
AUTOMATIC
ROLL SHEET
CUTTER



Engineered for fast, automatic cutting from rolls to sheets, this versatile machine permits quick size change-over, lowers cutting costs, lessens handling and reduces waste.

***Cuts any textile from rolls to sheets***

Towelling, pillow cases, diapers, wiping cloths, duck and canvas are no problems to this machine. It cuts just about any textile or synthetic. Judge its profit making possibilities for yourself. Send for a catalog now.

**CHARLES BECK MACHINE CORPORATION**
**50 CHURCH ROAD, KING OF PRUSSIA, PA.**

*Pacemakers since 1864 in the ENGINEERED APPLICATION of Sheet Cutters and Slitters*

# PROTECT PRODUCT QUALITY

## . . . *With a* NASH *No. 79* AUTOMATIC QUILL POLISHER

Prevent rough quills from tearing delicate filaments, and broken picks from damaging fabrics, by installing a famous No. 79 Automatic Quill Polisher. Cleans, buffs, and polishes loom bobbins at speeds up to 40 pieces per minute.

**Brochure with complete information upon request.**

NASH

**J. M. NASH *Company, Inc.***

2364 North 30th Street • Milwaukee 10, Wisconsin

SPECIAL FINISHING MACHINES SINCE 1890



CONTINUED FROM PAGE 192

### Teflon-Coated Valve Packing

Ordinary valves can be used for temperatures in the range of 450° F. with a plastic-coated valve being manufactured by Powers Regulator Co., 3434 Oakton St., Skokie, Ill.

Made of Teflon-coated asbestos, the packing will reduce valve maintenance and leakage at extremely high temperatures and pressures. It is suitable for temperatures from −50° F. to +400° F. and pressures up to 250 psi. without adjustment or repacking.

A packing-gland assembly to guide the stem better is available with the packing; the assembly results in less packing wear and hysteresis.

At present the packing-and-gland assembly is available in ¼- and ⅜-in. stems; later they will be made for other valve sizes.

The packing can be used with hot and cold water, steam, air, oil, ethylene, glycol, and similar materials. It is self-lubricating in normal use and remains resilient at low temperatures.

**Circle T-35 on Reader-Service Card**

### Improved Spinning Frame

An automatic starting clutch that starts the spindles turning ahead of the drafting rolls to free travelers and remove kinks from yarn has been added to the OM-S spinning frame made by O-M Spinning Machine Mfg. Co. Ltd., Osaka, Japan.

Other improvements include an automatic full-doff stop motion and antifriction top rolls.

The machine is sold in North America by Edward S. Rudnick, Box 244, New Bedford, Mass.

**Circle T-36 on Reader-Service Card**

### Card-Clothing Foundation

A card-clothing foundation with antirust and antitarnish wire, manufactured by Nippon Spindle Mfg. Co. Ltd., Amagasaki, Japan, has been introduced in the American market by Edward S. Rudnick, Box 244, New Bedford, Mass.

**Circle T-37 on Reader-Service Card**

### Switch

A switch to be installed in limited-access areas and to be actuated by a screwdriver is being sold by Micro



← For more data, write this page number on Reader-Service card.

# Using Salt Efficiently

by INTERNATIONAL SALT COMPANY, INC.

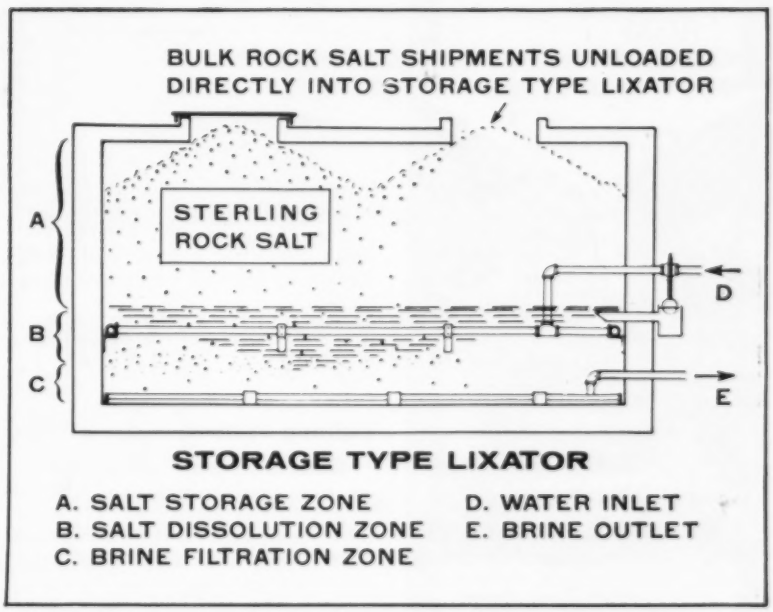
# Producing Crystal-Clear Brine at Lowest Cost—by Self-Filtration

Today, more and more companies are using a foolproof brine-making process that produces crystal-clear brine from rock salt, *without using supplemental filter beds or other filtering devices*. This process takes place in the "Sterling Lixator," a rock-salt dissolver developed exclusively by International Salt Company. Operating on International's principle of self-filtration, the Lixator produces a rock-salt brine so high in purity and so brilliantly clean and clear that it can be used in many operations formerly thought to require highly refined evaporated salt.

**Here, briefly, is how self-filtration works in the Sterling Lixator:** A Lixator is filled with Sterling Rock Salt. Water, admitted near the top, dissolves salt as it flows downward. While flowing down, the brine made in this way becomes fully saturated, and can dissolve no more salt. Still flowing down, this brine is *completely filtered* by the salt-crystal bed in the bottom portion of the Lixator. Thus, the Lixate Brine drawn off through a discharge pipe at the bottom of the Lixator is clean, pure, crystal-clear—and the only source of power used is gravity, which costs nothing!

**Other Lixator advantages.** In addition to this superbly clean, fully saturated Lixate Brine, a number of other advantages are yours, when you use a Lixator:

- The Lixator permits salt storage and brine making at one location most convenient to the point of salt entry. *Pipes* deliver brine to points of use.
- Because Lixate Brine is piped to points of use, the work of moving dry salt from storage piles to other plant locations is eliminated. This can produce substantial savings in labor.
- The Lixator *automatically* controls salt feed, water feed, and brine discharge. Rapid, uniform brine production is maintained constantly, because in the Lixator there is no bridging, caking, or channeling.




**The Storage Lixator** — designed for larger operations. This is a combination salt storage tank and dissolving tank. On delivery, rock salt is unloaded directly into the Storage Lixator. The rest is automatic.

**Many types of Lixators are available** from International Salt Company. In addition to Storage Lixators, there are Silo Lixators and Sterling Model Lixators—in numerous designs to suit any plant layout. And every Lixator operates on the economical self-filtration principle.

**For expert advice** on the particular Lixator type that will do the best job for you, phone or write the nearest district sales office, or write to us direct. One of our sales engineers will gladly show you how this remarkable brine-making equipment can help you use salt most efficiently and economically.

Using salt efficiently in its many industrial applications calls for technical knowledge and experience. International Salt Company has both. Plus a continuing program of research and development in salt. These things can be put to work for you, in your plant, to help you get the most out of the salt or brine you use.

* * *

**INTERNATIONAL SALT CO., SCRANTON, PA.**

*Sales Offices:* Atlanta, Ga.; Chicago, Ill.; New Orleans, La.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; St. Louis, Mo.; Newark, N. J.; Buffalo, N. Y.; New York, N. Y.; Cincinnati, O.; Cleveland, O.; Philadelphia, Pa.; Pittsburgh, Pa.; Memphis, Tenn.; and Richmond, Va.

Service and research are the extras in **STERLING SALT**

PRODUCT OF INTERNATIONAL SALT COMPANY, INC.



For more data, write this page number on Reader-Service card. →

# YARN CUTTERS

for

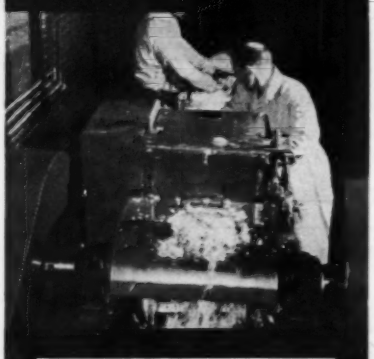
THREAD WASTE

CONTINUOUS FILAMENT

GLASS YARN & FIBER

FLOCKS

STAPLE



Taylor-Stiles Yarn Cutters cut nylon and other synthetics without fusing. Also used for cotton, wool and other fibres.

The Thread Waste Cutters cut large volume of tangled waste without jamming or fusing.

The Staple Cutters take synthetic or natural fibres in filament or tow form and cut them from ¼th inch to 12 inches long by change of sprockets or by vari speed motors or both.

**TAYLOR STILES & CO.**
15 Bridge St. Riegelsville N. J.

*SEND THIS COUPON TODAY*

TAYLOR-STILES & CO.
15 Bridge St., Riegelsville, New Jersey

Send me folder No. 201 with illustration and description of Taylor-Stiles Yarn Cutters.

NAME .....

COMPANY .....

ADDRESS .....

City ..... STATE.....


Switch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill. The switch is especially handy in places where it needs to be operated only occasionally, such as when circuits are being tested.

**Circle T-38 on Reader-Service Card**

## White Mercury Lamps

Two white mercury lamps that offer 63% more light just by changing from old lamps have been introduced by General Electric Co., Nela Park, Cleveland 12, Ohio. The lamps also reduce lighting cost as much as 33%.

**Circle T-39 on Reader-Service Card**

## Rotary Joint

A rotary joint for steam, air, water, oil, and gas is announced by Barco Mfg. Co., 539 N. Hough St., Barrington, Ill. The joint handles materials alternately hot and cold. Self-lubricating bearings are self-adjusting for wear.

**Circle T-40 on Reader-Service Card**

## Lighting Systems

Three fluorescent lighting systems are announced by Benjamin Electric Mfg. Co., Des Plaines, Ill.: (1) semi-direct equipment with 25% upward light, (2) equipment for 60-in., 90- and 100-w. preheat lamps, and (3) equipment for 48- and 96-in. high-output rapid-start lamps.

**Circle T-41 on Reader-Service Card**

## Steam Cleaner

A steam-cleaning unit that can be connected to any ¾-in.-valve steam outlet of 40-lb. pressure or more is available from Clayton Mfg. Co., El Monte, Calif.

**Circle T-42 on Reader-Service Card**

## Air Grinder

A lightweight 6-in. air grinder with an improved and more-powerful motor has been added to its line of industrial air tools by Thor Power Tool Co., Aurora, Ill.

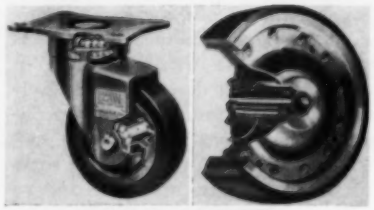
**Circle T-43 on Reader-Service Card**

CONTINUED ON PAGE 200


*Investigate the Advantages of*

# DARNELL

CASTERS AND WHEELS



**check these special features**

RUBBER TREADS . . . a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

RUST-PROOFED . . . by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

LUBRICATION . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Zerk fittings are provided for quick grease-gun lubrication.

STRING GUARDS . . . Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.

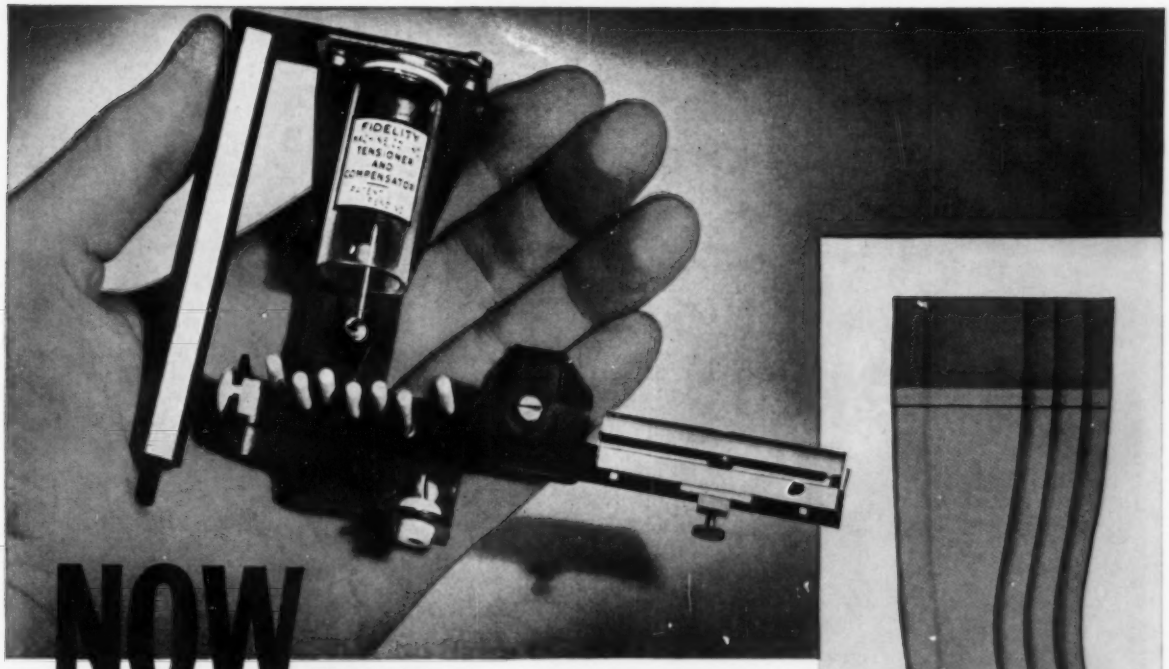
*. . . for the special requirements of*

**the TEXTILE INDUSTRY**

*Your* COPY OF THIS NEW **MANUAL** IS READY—

*Write for it!*

DARNELL CORPORATION, LTD.
DOWNEY (LOS ANGELES COUNTY) CALIFORNIA
60 WALKER STREET, NEW YORK 13, NEW YORK
36 NORTH CLINTON STREET, CHICAGO 6, ILLINOIS

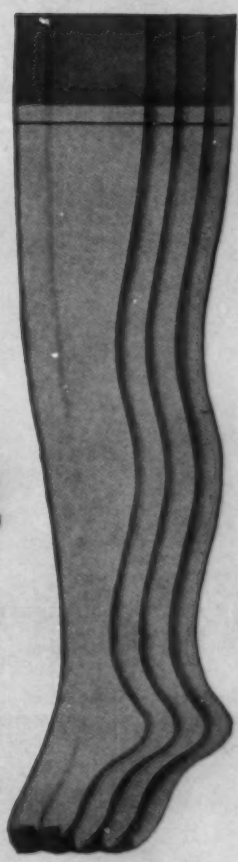



# NOW...

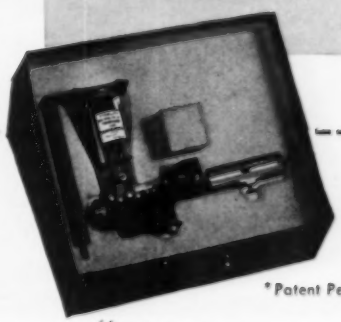
# SIMPLIFIED LENGTH CONTROL

# JUST $25.00 !

- **Easily installed *in minutes***
- **Permits use of new free-running pirns**
- **Maintains uniformity of stitch construction**
- **No wearing parts—no maintenance**
- **Completely self contained**
- **Tension adjustable in 1/10 gram increments**
- **Adaptable to *all* makes of Seamless Knitting Machines**
- **Maintains s-t-r-e-t-c-h specifications**



ONLY FIDELITY GIVES YOU LENGTH CONTROL *PLUS* YARN TENSIONING *PLUS* COMPENSATING—at a fraction of the *cost* for other length control devices *alone!* Mail this coupon for details *today.*



I want to know more about the Fidelity Yarn Tensioner and Compensator.*

☐ Send additional technical information

☐ Have Fidelity representative call ☐ My purchase order is enclosed

Name_____ Title_____

Company_____

Address_____

*Patent Pending

*Designers and Builders of Intricate, Automatic Precision Machines*

SINCE 1911

## FIDELITY MACHINE COMPANY, INC.

3908-18 FRANKFORD AVENUE, PHILADELPHIA 24, PA.

EXPORT DEPT.: 11 BROADWAY, NEW YORK 4, N.Y.

SOUTHERN REPRESENTATIVE: C. S. BRANNOCK, P.O. BOX 763, MT. AIRY, NORTH CAROLINA



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SINCE 1869

"VERYBEST" LOOM NECESSITIES

JACOBS

THE BULLARD CLARK COMPANY

JACOBS

SOUTHERN DIVISION
Charlotte, N. C.

NORTHERN DIVISION
Danielson, Conn.

LOCKWOOD GREENE PROJECTS IN...
WOOLEN and WORSTED

Lockwood Greene has completed over 500 engagements in the woolen and worsted field, and in the entire textile industry projects valued at over three quarter billion dollars.

**Ameratron Corporation,
Barnwell, S. C.
Division of Textron American, Inc.**
A fully air conditioned plant of 528,000 sq. ft. floor area, with new machinery on men's and women's wear woolens, its purpose to recapture the position formerly held by the American Woolen Co. when it concentrated its operations in New England.

CONTINUOUS MANAGEMENT SERVICES FROM SITE SELECTION TO PLANT COMPLETION

LOCKWOOD GREENE ENGINEERS • ARCHITECTS

BOSTON 16, MASS. 316 Stuart Street
NEW YORK 17, N.Y. 41 East 42nd Street
SPARTANBURG, S. C. Montgomery Building

OVER A CENTURY OF INDUSTRIAL PLANT DESIGN EXPERIENCE • BROCHURE ON REQUEST

Clear sparkling colors produced with more economical dyestuffs are among the advantages assured by use of TEN-O-FILM Starches.

# For a clear size that enhances **COLOR** use **TEN-O-FILM**® starches

For use with the new quick curing or polymerizing resins, you'll find no equal to TEN-O-FILM Starches.

Available in a range of fluidities to meet any required fabric stiffness, these unique starches retain their free-flowing characteristics at the lower temperatures employed in finishing.

Also, because both sizing and desizing operations using TEN-O-FILM are conducted at lower temperatures, with "bleeding" thereby reduced, yarns can be dyed with more economical dyestuffs.

More information? Just contact our nearest sales office or write to:

**CORN PRODUCTS SALES COMPANY**
17 Battery Place, New York 4, N. Y.

Corn Products makes these famous starches for the TEXTILE INDUSTRY:
**EAGLE® · FOXHEAD® · GLOBE® · CLARO® · TEN-O-FILM® · GLOBE® Dextrines**



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KNOCK OUT STATIC!

YOU WON'T MISS WITH A SIMCO "MIDGET"

There is a SIMCO "*Midget*" static bar designed for every textile application . . . *guaranteed* to eliminate static . . . safely . . . effectively . . . inexpensively! New *shockless* bars are also available. Equip your machinery *now*.

the SIMCO company
920 Walnut St.
Lansdale, Pa.


## EQUIPMENT & SUPPLY NEWS

CONTINUED FROM PAGE 196

### Automatic Hoist System

The development of a system of automatic-duty cycle hoists that combine to form a flexible, continuous processing system is announced by Yale & Towne Mfg. Co., 11,000 Roosevelt Blvd., Philadelphia 15, Pa.

**Circle T-44 on Reader-Service Card**

### Centralized Lubrication

A centralized lubricating system that withstands temperatures up to 500°F. while providing fully automatic lubrication has been announced by Bijur Lubricating Corp., Rochelle Park, N. J. Several lubricant suppliers have developed oils to stand up at these temperatures.

**Circle T-45 on Reader Service Card**

### Electric Motor

A motor series, Frame 566, is announced by Doerr Electric Corp., Cedarburg, Wis. The motor is a combination of the 56 frame components and has a base to give the shaft height and mounting holes of a standard 66 frame.

**Circle T-46 on Reader-Service Card**

### Indicators and Controllers

A full line of single and multipoint-resistance thermometer indicators and controllers that have accurate readings with the sensing bulb as much as 1,000 ft. from the indicator is available from West Instrument Corp., 4363 W. Montrose, Chicago 41, Ill.

**Circle T-47 on Reader-Service Card**

### Electronic Analyzing System

An electronic system designed to analyze the operation of boilers in steam-generating plants has been developed jointly by Babcock & Wilcox, 161 E. 42nd St., New York, N. Y., and Bailey Meter Co., Cleveland, Ohio.

**Circls T-48 on Reader-Service Card**

CONTINUED ON PAGE 202


Out Goes LINT · FLY TRASH
from your
SPINNING FRAMES and ROVING FRAMES
Quickly • Economically

by using
M·B AMOSKEAG PNEUMATIC ROLL PICKER

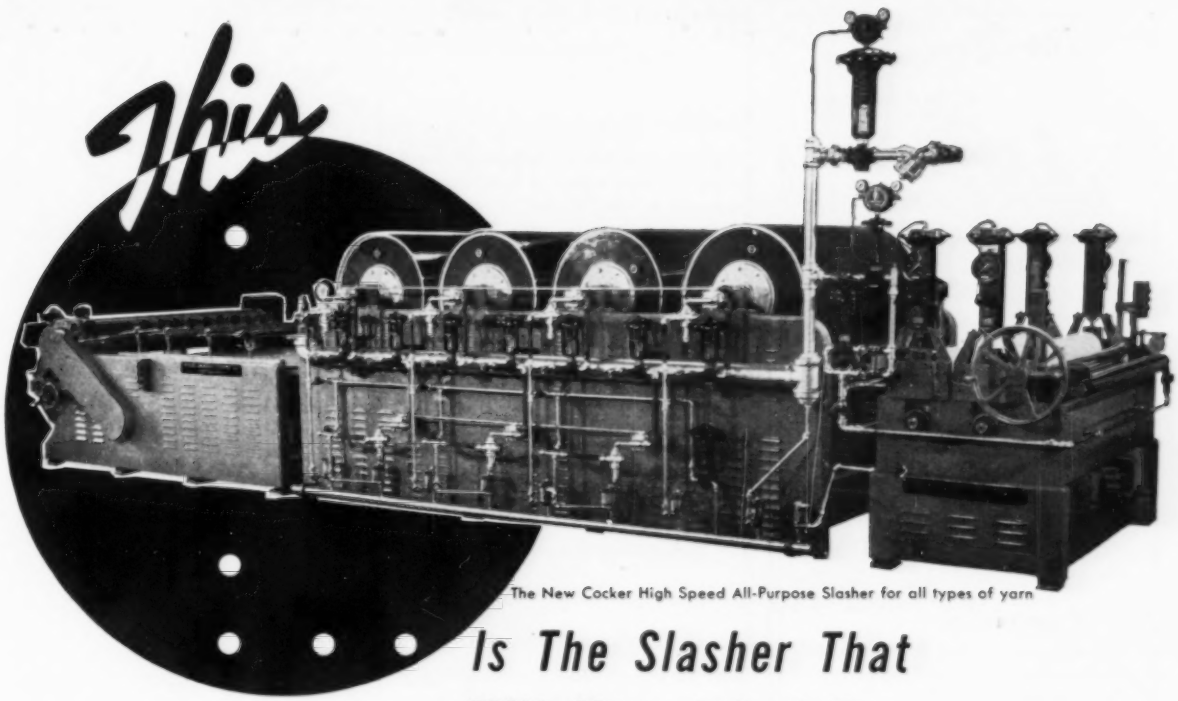
MODEL A-VT-A

A pneumatic tool especially designed for the specific purpose of REMOVING LINT and FLY from the top rolls of Spinning Frames and Roving Frames. Saves time and does a better job by substituting mechanical cleaning instead of laborious hand methods. Air deflector prevents fly and lint being blown into yarn when spinning. Adjustable valve permits any desired spindle speed.

*Write for Literature*

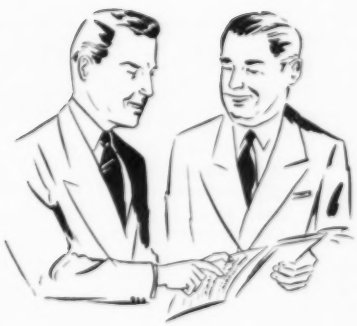
M·B PRODUCTS
46 VICTOR AVE., Div. 16
DETROIT 3, MICHIGAN

Geo. S. HARWOOD & Son, Inc.
50 Lagrange St., Worcester 8, Mass.




The New Cocker High Speed All-Purpose Slasher for all types of yarn

# Is The Slasher That Mill Men Asked For



Hundreds of mill men told us what features they wanted in a new slasher. Cocker engineers, backed by twenty years of study and experience, have incorporated these features in the New Cocker All-Purpose Slasher.

Some of the many advantages of this new Cocker Slasher are:

1. Air operated carrier and delivery rolls.
2. Air operated ironing compressor roll with finger-tip variable pressure control.
3. A fast and simple latch release for beam doffing, requiring no change of position of beam carriage.
4. Self locking split rod holders.
5. Tension control at two points on the head end as well as cylinders and size box.

The stainless steel size box has also been greatly improved.

Cocker Slashers are built to ASME Code Construction in both 15 and 65 PSI.

Former Cocker Slasher models were already acknowledged to be the most efficient, economical, and versatile slashers on the market. This new Cocker Slasher is truly the Slasher of Tomorrow. Get full information on it today.

*New England and Canadian Representatives:*
J. S. Fallow & Co., 279 Union St., New Bedford, Mass.
1215 Greene Ave., Montreal 6, Canada

*Plant and Offices at Ranlo, N. C.*
(Mailing Address Gastonia, N. C.)

THE LEADER
COCKER
AROUND THE WORLD

Machine and Foundry Co., Gastonia, N. C.

**WORLD'S LARGEST DESIGNERS AND BUILDERS OF COMPLETE WARP PREPARATORY EQUIPMENT**

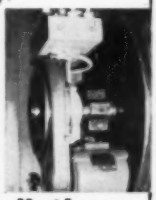


For more data, write this page number on Reader-Service card. →

The *New* **Precision Card Drive** *Complete Compact Safe*

**Complete:**
A preassembled package unit including motor, drive, and control box. No extras to buy.

**Compact:**
Requires same space as pulley units.



(Top view)

**Quick Installation:**
Just slide on cylinder shaft — bolt — and connect power.

**Smooth Drive:**
Rheostat control starts smoothly and accelerates without jerking or overloading. Inches cards into position for settings and adjustments.

**Safe:**
Eliminates exposed pulleys, belts and drives. All parts of the Precision Drive are completely enclosed and control box is easily accessible.

**Tops in Efficiency:**
Eliminates costly down time due to line shaft and belt maintenance. Smooth positive drive improves quality.

Modernize your cards with the Precision Electric Clutch Card Drive. Write for Bulletin 225 for complete information.

**Precision Gear & Machine Co.**
2001 N. Tryon St. • ED 4-6857
Charlotte 1, North Carolina


## EQUIPMENT & SUPPLY NEWS

CONTINUED FROM PAGE 200

### Precision Grinders

A complete line of industrial grinders and a dust collector have been introduced by the Walker-Turner Div., Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.

**Circle T-49 on Reader-Service Card**

### Suction Gun

Designed for high performance at low cost, a suction gun for transferring fluids such as gear, transmission, and differential lubricants is available from Lincoln Engineering Co., Natural Bridge Ave., St. Louis 20, Mo.

**Circle T-50 on Reader Service Card**

### Totally Enclosed Motor

A totally enclosed nonventilated motor in new NEMA standards is announced by General Dynamics Corp., Electro Dynamic Div., Bayonne, N. J. Motors, Type H, are designed for operation where noncombustible dust and moisture are prevalent. The motor sizes are 182, 184, 213, and 215 frames.

**Circle T-51 on Reader Service Card**

### Roller-Chain Sprockets

Double-strand roller-chain sprockets that require no reboring or other machining for installation on shafts are being sold by Dodge Mfg. Corp., Mishawaka, Ind., through its distributors. The sprockets are available in pitch sizes of ½ to 1 in.

**Circle T-52 on Reader Service Card**

### Proximity Control

Its MEK-3030 electronic proximity control can detect the presence of an insulator or conductor at the detecting point without making contact with the surface, according to Machinery Electrification, Inc., Northboro, Mass.

**Circle T-53 on Reader Service Card**

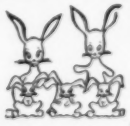
### Plug-In Circuit Breaker

A plug-in circuit breaker with an isolated line terminal has been an-

CONTINUED ON PAGE 208

42 sales offices and 15 factories give you fast, dependable corrugated box service. Better see H & D.

**HINDE & DAUCH**
Division of West Virginia Pulp and Paper Company



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• Arouses Interest • Creates Preference

**DIRECT MAIL**
• Gets Personal Attention • Triggers Action

After your prospect has been convinced by Display Advertising, he still must act. A personalized mailing piece, is a powerful action-getter. Send for our Industrial Direct Mail Catalogue, 150 lists available.

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DIRECT MAIL LIST SERVICE

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Please forward my free copy of the McGraw-Hill "Industrial Direct Mail Catalogue."

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City_____ State_____

*Exclusive* PATENTED CONSTRUCTION!

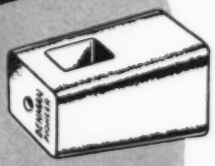
# Denman

## PIONEER DROP BOX REVERSIBLE PICKERS

☆ Greater Strength ☆ More Resiliency

☆ Longer Life

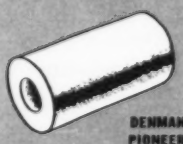
DENMAN PIONEER
DROP BOX REVERSIBLE PICKER



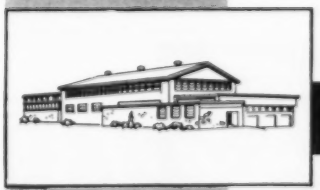
DENMAN PIONEER
REGULAR PICKER

DENMAN
PIONEER
HOLD-UP STRAP

DENMAN
PIONEER
SWEEPSTICK



DENMAN
PIONEER
SPINDLE ROD BUMPER



### SAVES PICKER STICK WEAR AND TEAR!... INCREASES LOOM EFFICIENCY!

Denman's Drop Box picker construction eliminates the weak spots in other pickers.

The insertion of the patented wedge provides a strong, smoothly tapered web, completely free from wrinkles. This exclusive feature also eliminates the resin-leak into the picker stick aperture. This leak often forms rough spots in other pickers which abrade and wear the picker stick.

For greater efficiency and economy, for smooth performance, specify precision engineered and crafted original Denman Pioneer Loom Parts, famous for more than twenty years.

*Ask The DENMAN Sales Agent Nearest You . . .*

**FOR VIRGINIA, NORTH and SOUTH CAROLINA:**
THE KARL H. INDERFURTH CO., INC. (Exclusive Selling Agent and Warehouse)
P.O. Box 6161, Charlotte, N. C.

**FOR GEORGIA, ALABAMA, and TENNESSEE:**
R. E. L. HOLT, JR. & ASSOCIATES, INC., Drawer 1319, Greensboro, N. C.
Resident Agent: John P. Norman, P.O. Box 445, West Point, Ga.

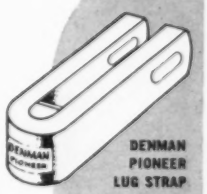
**FOR CENTRAL ATLANTIC and NEW ENGLAND STATES and CANADA:**
TEXPLANT CORPORATION, 695 Summer Street, Stamford, Conn.

**FOR THE MIDDLE WESTERN STATES:**
ALBERT R. BREEN, 80 E. Jackson Blvd., Chicago 4, Ill.

**FOR THE SOUTH WESTERN STATES:**
R. D. HUGHES COMPANY, 9425 Garland Road, Dallas, Texas

*Other Representatives Throughout the World . . . Or Write*





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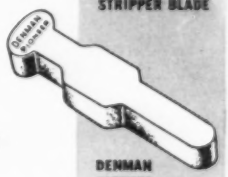

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Every order gets special attention at the steel service centers of Distributors of Armco Stainless Steels. Whether you need a sheet or two for urgent maintenance, or several tons for an item of new equipment, they will meet your exact requirements—and do it quickly.

In addition, their mill-trained staffs can lend valuable assistance to your engineers and service men, and Armco Distributors can "cut" stainless steel to your exact specifications.

Next time you need stainless steel, make sure you get this personalized service. Just contact the Armco Stainless Distributor near you. He is listed on this page.

## (A)—Sheet, strip & plate

**ALABAMA**
BIRMINGHAM
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**ARIZONA**
PHOENIX
Ducommun Metals & Supply Co. (B)

**CALIFORNIA**
BERKELEY
Ducommun Metals & Supply Co. (B)
EMERYVILLE
Electric Steel Foundry Co. (AB)
LOS ANGELES
Ducommun Metals & Supply Co. (B)
Electric Steel Foundry Co. (AB)
NATIONAL CITY
Ducommun Metals & Supply Co. (B)

**COLORADO**
DENVER
C. A. Crosta, Inc. (A)
Electric Steel Foundry Co. (AB)
Metal Goods Corp. (AB)

**CONNECTICUT**
HARTFORD
The American Steel & Aluminum Corp. (AB)
Peter A. Frasse & Co., Inc. (AB)

**FLORIDA**
JACKSONVILLE
J. M. Tull Metal & Supply Co. (AB)
MIAMI
J. M. Tull Metal & Supply Co. (AB)
TAMPA
J. M. Tull Metal & Supply Co. (AB)

**GEORGIA**
ATLANTA
J. M. Tull Metal & Supply Co. (AB)

**ILLINOIS**
CHICAGO
Central Steel & Wire Co. (AB)
Chicago Steel Service Co. (B)

**KANSAS**
WICHITA
Metal Goods Corp. (AB)

**LOUISIANA**
NEW ORLEANS
Metal Goods Corp. (AB)
The Orleans Steel Prod. Co., Inc. (A)

**MAINE**
AUBURN
Brown-Wales Company (AB)

**MARYLAND**
BALTIMORE
Seaboard Steel & Iron Corp. (B)

**MASSACHUSETTS**
CAMBRIDGE
The American Steel & Aluminum Corp of Massachusetts (AB)
Brown-Wales Company (AB)
Industrial Stainless Steels, Inc. (B)
FALL RIVER
Congdon & Carpenter Co. (AB)

**MICHIGAN**
DETROIT
Central Steel & Wire Co. (AB)

**MISSOURI**
KANSAS CITY
Richards & Conover Steel Div. (A)
NORTH KANSAS CITY
Metal Goods Corp. (AB)
ST. LOUIS
Metal Goods Corp. (AB)
E. E. Souther Iron Co. (A)

**NEBRASKA**
OMAHA
Gate City Steel, Inc. Omaha (A)

**NEW YORK**
BUFFALO
Peter A. Frasse & Co., Inc. (AB)
Seneca Steel Service Co. (AB)

## (B)—Bar and wire

SYRACUSE
Peter A. Frasse & Co., Inc. (AB)

**METROPOLITAN NEW YORK**
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HILLSIDE N. J.
Edgcomb Steel & Aluminum Corp. (AB)
LYNDHURST, N. J.
Peter A. Frasse & Co., Inc. (AB)
UNION, N. J.
Mapes & Sprowl Steel Co. (AB)

**NORTH CAROLINA**
CHARLOTTE
Edgcomb Steel Co. (AB)

**OHIO**
CINCINNATI
Central Steel & Wire Co. (AB)
CLEVELAND
Cleveland Tool & Supply Co. (B)
Viking Steel Co. (AB)
COLUMBUS
Vorys Brothers, Inc. (AB)

**OKLAHOMA**
TULSA
Metal Goods Corp. (AB)

**OREGON**
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PORTLAND
Electric Steel Foundry Co. (AB)

**PENNSYLVANIA**
PHILADELPHIA
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YORK
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York Corrugating Co. (A)

**RHODE ISLAND**
PROVIDENCE
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**TENNESSEE**
MEMPHIS
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**TEXAS**
DALLAS
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HARLINGEN
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LUBBOCK
Moncrief-Lenoir Mfg. Co. (AB)
SAN ANTONIO
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Moncrief-Lenoir Mfg. Co. (AB)

**WASHINGTON**
SEATTLE
Electric Steel Foundry Co. (AB)
SPOKANE
Electric Steel Foundry Co. (AB)

**WASHINGTON, D. C.**
York Corrugating Co. (A)

**WISCONSIN**
MILWAUKEE
Central Steel & Wire Co. (AB)

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Firth-Brown Steels, Ltd. (AB)
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Esco, Ltd. (AB)

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SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION



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© D.R. 1958 *Mr. C. H. Stroupe of Howe Distributing Co. (left) is shown with spinning mill superintendent.*

# Dayton Variable Speed V-Belts Save $19.00 a Frame...Increase Output 7%

*at Majestic Manufacturing Company, Belmont, N. C.*

"By converting our 44 spinning frames to Dayton Variable Speed Drives, we increased production by 7% and have virtually eliminated downtime for speed changes," states the superintendent of a cotton spinning plant in Gaston County, North Carolina.

"We produce combed cotton yarns in counts ranging from 50's to 80's. On certain counts a 10% increase in front roll speed over our previous speeds has not affected the quality of our yarn and has made the job run equally as well. Previously, each time we changed pulleys the frame was down from 30 to 50 minutes.

"When we converted to Dayton Variable Speed Drives we eliminated our pulley-switching problem. Now we change speeds in a matter of seconds and production has jumped 7%!

"Each drive is equipped with a single Dayton Variable Speed V-Belt costing only about $14.50, in place of five standard belts.

"Operating 24 hours a day, 5 days a week, Dayton V-Belts give us from 3 to 5 years service. As a result we keep only 2 to 4 belts in inventory. In any event, our Dayton Distributor, Howe Distributing Company, Inc., of Gastonia, N. C., will deliver replacements in 30 minutes."

**Dayton Rubber**

*World's Largest Manufacturer of V-Belts*

*Consult the Yellow Pages of your telephone directory for the name of your nearest Dayton Distributor or write The Dayton Rubber Company, Industrial Replacement Division, Dayton 1, Ohio.*



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"THIS LUBRICANT CUT OUR LUBRICATION COSTS IN HALF"

says-PHILADELPHIA QUILTING CO.

"Trouble from conventional greases floating off hot shafts of our quilting machines caused us to try a LUBRIPLATE Lubricant. It proved so satisfactory that we are now using it as an 'all-purpose' grease throughout our plant. We feel that LUBRIPLATE is saving us 50% in lubrication costs."

*W. Szczepanski,*
*Chief Maintenance Engineer*

**REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.**

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.

For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

## Standard Time for Work Reduces Maintenance Cost

If you want to reduce and control maintenance cost, you can set up maintenance standards and use them to good advantage.

A standard time for maintenance is the time it should take to perform any specific maintenance job. The job can be any one of an infinite number that might be performed by carpenters, machinists, electricians, pipe fitters, painters, and any other maintenance employee.

The maintenance standard is how long it should take to paint a wall, hang a door, replace a broken windowpane, etc.

### Work Is Scheduled Each Day

The gains to be derived from proper control of maintenance work with objective standards are great. Maintenance work may be scheduled from day to day in the same way that production operations are planned. The basic requirement of a sound plan of maintenance is that all jobs have predetermined standard times established.

The primary objectives of shop planning are:

1. To provide each shop group with a planning board to be used by foremen in assigning work to employees.
2. To assure that to the highest degree possible one full day's work is laid out for each employee on the day before the work is to be done. For example, tomorrow's work is planned today, which allows a layout of adequate tools, parts, and other job preparations.
3. Translate work called for on work orders into terms of manhours, number of men required, and elapsed time.
4. To determine job priority.
5. To assign work by job priority and available manpower.
6. To follow progress of jobs to completion.
7. To develop load information necessary to size the maintenance forces properly and to be used as a guide in (a) increasing or decreasing the work force, (b) overtime assignments, and (c) subcontracting overloads to outside shops or contractors.

Scheduling of maintenance activities is segregated into two basic classifications: (1) sequence planning and (2) formalized planning.

### Sequence Planning for Minor Jobs

Sequence planning refers to the planning of jobs of a repair nature in sequence of necessity. When work orders are received by a craft foreman, they are scrutinized carefully and their order of priority is determined.

A planning board with clips attached to it is furnished for each craft; each clip represents a mechanic or a group of mechanics. Work orders are assigned to individual workers or groups by placing the orders behind the proper clips. Usually enough work is assigned each craftsman for at least one day ahead. This plan of scheduling assures that the most essential jobs are given priority.

In plants where most maintenance is on minor repair jobs, the sequence plan of scheduling work is effective.

### Formalized Planning for Big Jobs

In many plants, however, major maintenance requirements consist of work of a new-construction nature or large repair jobs; and a more formalized plan of scheduling is best.

For a formalized-planning schedule, work orders are selected each day in order of priority and a day's work is planned for each tradesman on a work sheet.

To use the formalized-planning schedule in your own plant, you should project all major work on a project-planning sheet (Gantt chart), which shows the sequence of operations, number of employees required by crafts, and sequence by crafts. Follow the progress of jobs daily, and note the percent of completion on the chart.

Use the estimates of other standards established in determining manhour requirements for your scheduling program. Jobs can be scheduled far in advance when they fit in with shutdowns or with available dates predicted on production schedules.

### Effective Planning Cuts Overtime

Priorities of smaller jobs will change from day to day, but you should review the workload periodically so that you can take corrective action before employees are overloaded or are idle. Effective planning minimizes overtime or week-end assignments.

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TEXAS KNITTING MILLS • TOWER HOSIERY MILLS • TOWN HOUSE HOSIERY PLANT • TRIGG KNIT • TRIMFIT OF CALIFORNIA • TRI STATE HOSIERY CO., INC.
TRIUMPH HOSIERY MILLS, INC. • TROXLER HOSIERY CO. • TROY CRAFT, INC. • UNION FINISHING CO. • UNION MANUFACTURING CO. • UNITED HOSIERY MILLS, INC.
VANCE & RING, INC. • VANETTE HOSIERY MILLS • VAN RAALTE, CO., INC. • VENUS MILLS, INC. • VICTORIA HOSIERY MILLS, LTD. • VIRGINIA LEE HOSIERY MILL
VIRGINIA MAID HOSIERY MILL • VOGLER HOSIERY CO. • VUNCANNON HOSIERY MILLS, INC. • WADESBORO F. F. HOSIERY CO. • WALDENSIAN HOSIERY MILLS
WALNUT TEXTILES, INC. • WARE KNITTERS, INC. • WAYNE KNITTING MILLS • WEARMORE HOSIERY CO., INC. • WEESOX HOSIERY MILLS • WEISSPORT DYE WORKS
WELDREST HOSIERY LIMITED • WEST GROVE HOSIERY MILL • WIGWAM HOSIERY MILLS, INC. • WILLCRAFT HOSIERY MILLS, INC. • WILLIS HOSIERY MILLS
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# Marvel Specialty Company

SUPPLYING

## THE NATION'S FINEST MILLS

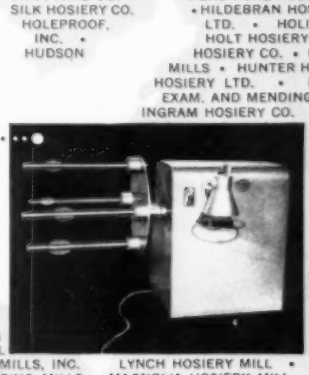
WITH

- THE MARVEL METER
- THE ACE THROAT PLATE
- THE MARVEL MENDING *and* IRON ATTACHMENT

*and NOW.....*

## THE MARVEL-X

An automatic machine for turning and inspecting all types of infants', children's and men's hosiery.



## MARVEL SPECIALTY COMPANY

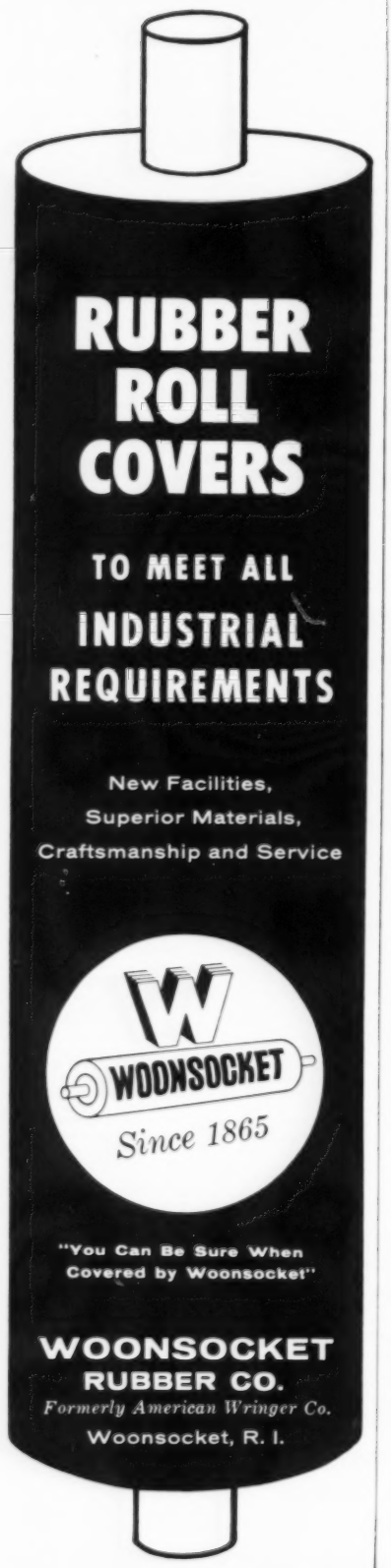
*Paducah, Kentucky*

MV-5

The New **MARVEL-X** Machine

Offers to half hose manufacturers substantial savings through increased production and improved quality

**WILL WELCOME OPPORTUNITY OF DEMONSTRATING THIS MACHINE IN YOUR PLANT**




By referring to the planning charts, you can:

1. Keep informed on over-all progress.
2. Give attention to jobs behind schedule where help is required.
3. See clearly (a) what effect rush jobs have on the jobs in process and (b) which jobs can more conveniently be delayed, if necessary.
4. Keep mill-production men informed on the status of jobs in their departments without special field checks, which take a lot of time and are often inaccurate.

Periodic meetings of maintenance-department supervisors are necessary to schedule and plan work. The planing board is used here for planning major jobs and keeping up with their progress.

### Work Is Planned Weeks Ahead

All work done by the maintenance department falls in three classes: (1) routine preventive maintenance, (2) maintenance authorized on work orders either by repairs or new projects, or (3) unpredictable breakdown repairs.

With proper estimating or by using standard times for maintenance, you can classify your workload and segregate this load in the number of weeks' work ahead by each craft. This estimating can be done at any time, but it's best to do it at monthly intervals.

The ranges of weeks' work ahead can be developed for one or more plants, and the work force can be increased or decreased if the future workload falls outside these limits.

### All Work Is Controlled

Standard times for maintenance jobs provide a basis for establishing control of all maintenance work. Actual times for each job are accumulated and summarized each week by craft and are compared with the standard or earned hours. Normally a four- to five-week running average is reported so that the effect of large jobs completed during any one reporting period is minimized.

Incentives can be applied to maintenance work to secure the cooperation of maintenance employees. Particularly where incentives for production employees exist, it is highly desirable to provide incentive opportunities to maintenance and other indirect employees. The productivity-measurement feature obtainable when standards are available will enable you to institute a practical way of sharing cost reduction with maintenance employees.

The extent to which craft and departmental incentives are employed depends largely on the size and complexity of the maintenance department. Therefore incentives may be designed for individual crafts or for the entire department.

### Formula Determines Incentive Pay

In developing the pay formula, you must be sure that the standards have been developed uniformly. If the standards are based on data derived from work measurement and have been leveled to a normal pace, incentive earnings can be calculated on a one-for-one basis on performance above 100%.

However, if the standards are established on the past-performance basis, they must be leveled on a work-sampling basis for the one-for-one formula.

Another basis for calculating payment where historical standards are used is to agree on the percent effectiveness and to share any improvement over the present effectiveness. The one-half after 10% formula has worked successfully in many instances.

In effect, this formula admits that standards set on past practice will be loose. Rather than to level the performance down or to spend more money to establish work-measured standards, the condition is recognized and built into the pay formula. *Charles C. Winston, Ernst & Ernst, in McGraw-Hill Maintenance Engineering Handbook*

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## EQUIPMENT & SUPPLY NEWS

CONTINUED FROM PAGE 202

nounced by General Electric Co., Plainville, Conn. It is used to connect an emergency circuit to an alternate power supply and is available in 15, 20, and 30 amps., 120 v., a.c.

**Circle T-54 on Reader-Service Card**

### Pneumatic Cylinder

Single- and double-acting $\frac{5}{8}$-in.-bore hydraulic and pneumatic cylinders are available from Airoyal Co., 1990 Springfield Ave., Maplewood, N. J.

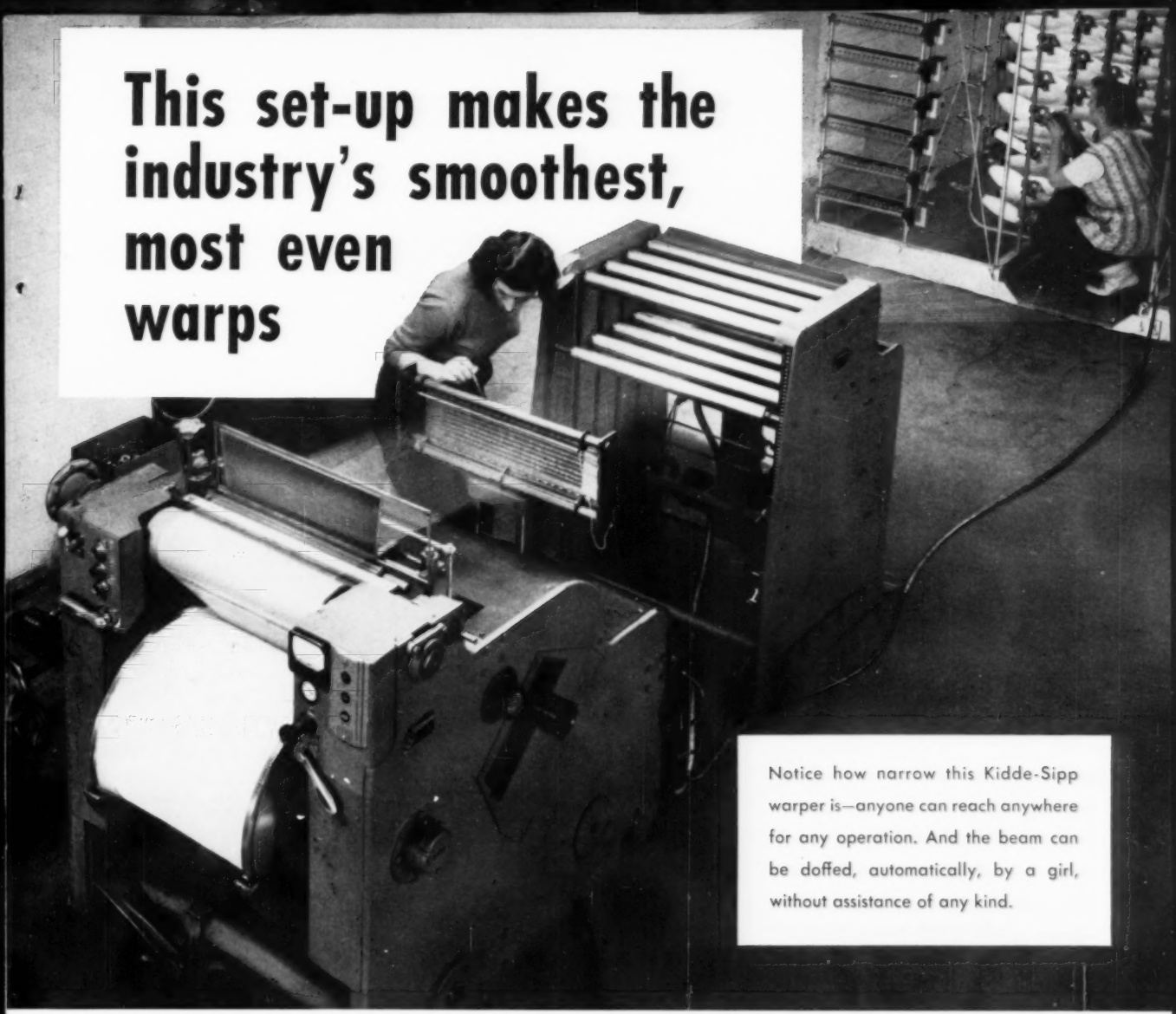
**Circle T-55 on Reader-Service Card**

### Pressure Regulators

C. A. Norgren Co., Englewood, Colo., announces important advancements in its line of pressure regulators for use with air-operated equipment.

**Circle T-56 on Reader-Service Card**

# This set-up makes the industry's smoothest, most even warps



Notice how narrow this Kidde-Sipp warper is—anyone can reach anywhere for any operation. And the beam can be doffed, automatically, by a girl, without assistance of any kind.

## it's the KIDDE-SIPP warper with accumulator and creel

The smoothest, most even warp beams available today are being turned out by Kidde-Sipp warpers . . . particularly when backed up by a Kidde-Sipp accumulator and a Kidde-Sipp Creel. Here's why:

Yarn is never scuffed on the warper because brakes on the measuring roll, compression roll, and beam are all synchronized electrically. Furthermore, yarn builds up evenly because the compression roller has 2 hydraulic cylinders, one at either end (instead of just one in the center). The balanced pressure that results gives you perfectly even build-up of yarn. And the hydraulic cylinders produce uniform cushion pressure so that the compression roller will not chatter or bounce.

The accumulator is electrically synchronized with the warper, so that, when the yarn must be backed off to recover a broken end, proper tension is maintained. And even the heaviest packages won't sag out of alignment on the versatile Kidde-Sipp Creel. New, stronger package holders and adapters are the reason. They are made of aluminum, which also puts a stop to rust rubbing off on the yarn.

There are a lot more reasons why you get a better beam with Kidde-Sipp Warpers, Creels and accumulators. Find out more about them by writing to:

TRICOT AND RASCHEL MACHINES • TRICOT WARPERS • HORIZONTAL WARPERS • BEAMERS
CREELS • SLASHERS • WINDER-REDRAWS • TENSOMETERS • TENSION COMPENSATORS

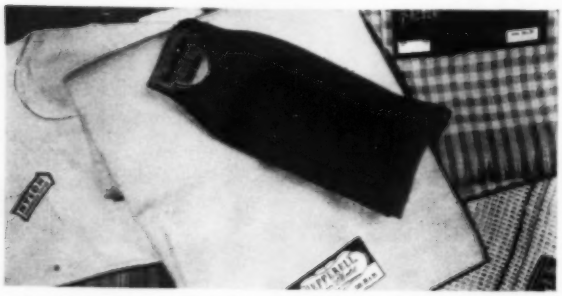
**Kidde**

MANUFACTURING CO., INC. — 42 FARRAND STREET — BLOOMFIELD, NEW JERSEY

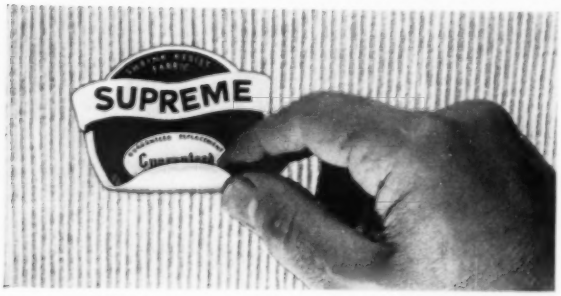
SOUTHERN OFFICE — 267 W. MAIN ST., GASTONIA, N. C.

*The word KIDDE is the trademark of Walter Kidde & Company, Inc., and its affiliated companies.*

# New TEX® label solves fabric labeling problems!



**1. TEX** stays put on natural and synthetic fabrics– knitted or woven. Eliminates need for various type labels for different materials. TEX sticks under repeated flexing, rough handling . . . ensures product identity, attractive appearance at point-of-sale.




**2. TEX** labels peel off clean, leave no adhesive residue whatsoever. Special adhesive releases smoothly, does not cause fabric "pull", or label split or tear.

**3. TEX** labels go on easy. Coated with heat-activated adhesive, TEX labels can be applied as part of pressing operation, steam or dry. Or hand iron may be used. Label moistening is eliminated entirely; no glue smears from operators' fingers.

**ASK YOUR PRINTER ABOUT THE NEW TEX HEAT SEAL LABEL FOR TEXTILES, OR WRITE FOR SAMPLE SHEETS.**

NASHUA Corporation NASHUA

**DEPT. TW-38, 44 FRANKLIN STREET, NASHUA, N. H.**




## NEWS ABOUT SUPPLIERS

**ASR PRODUCTS CORP.**, New York, N. Y.–Has appointed G. A. LaCas director of the Industrial Div. and C. J. Vande-Water director of manufacturing. . . . **ALLIED CHEMICAL & DYE CORP.**, New York, N. Y.–Has announced that production has begun at the new sulfuric-acid plant of the General Chemical Div. in Elizabeth, N. J. Gordon B. M. Walker has been named a division industrial engineer of the National Aniline Div. . . . **AMERICAN CYANAMID CO.**, New York, N. Y. –Has named B. R. Putnam, Jr., manager of the petrochemicals department of the Organic Chemicals Div. M. Clark has been appointed to the sales and merchandising staff of the Fibers Div. . . . **AMERICAN PULLEY CO.**, Philadelphia, Pa.–Has acquired the business and all the assets, with the exception of the real estate, of Hubbard Spool Co., Garrett, Ind. Hubbard Spool Co. will operate as a division of American Pulley Co.

FRANK MAY (left) has been appointed general manager of Ansbacher-Siegle Corp., Staten Island, N. Y. JAMES A. JONES, JR., (center) has been named manager of field sales for Zefran for Dow Chemical Co., New York, N. Y. HAROLD J. JOHNSON (right) has been appointed assistant general manager in charge of research and development at Denman Textile Rubber Co., Cuyahoga Falls, Ohio.

**AMERICAN TEXTILE MACHINERY ASSOCIATION**, Boston, Mass.–Has re-elected J. H. Hunter, president of J. H. Hunter Machine Co., North Adams, Mass., president. W. K. Child, vice president of Draper Corp., Hopedale, Mass., has been re-elected vice president. F. Gorham Brigham, Jr., treasurer of Saco-Lowell Shops, Boston, Mass., has been elected treasurer. . . . **AMERICAN VISCOSE CORP., FILM DIV.**, Philadelphia, Pa.–Has promoted T. O. Williams to general sales manager. R. E. Weaver has succeeded B. F. Morgan as Avisco cellophane representative in the Carolinas. . . . **ATLANTIC STEEL CO.**, Atlanta, Ga.–Has appointed G. E. Brooks assistant general manager of sales. C. F. Nelson, Jr., has been named sales representative for the company's Atlanta, Ga., area.

**BORDEN CO., CHEMICAL DIV.**, New York, N. Y.–Has changed its name to Borden Chemical Co., Div. of Borden Co. . . . **CHEMSTRAND CORP.**, Decatur, Ala.–Has appointed J. W. Tucker assistant manager of Acrilan sales. . . . **DIXON CORP.**, Providence, R. I.–Has announced that it is now fully prepared to make complete saddle-guide change-overs for spinning frames from the roller beam up. . . . **DOW CHEMICAL CO.**, New York, N. Y.–Has appointed G. J. Zahringer, Jr., manager of market research for Zefran. A. J. Lazarus has been named manager of product-information service for the new fiber. . . . **E. I. DU PONT DE NEMOURS & CO., INC.**, Wilmington, Del.–Has promoted J. J. Barnhardt, Jr., manager of the textile section of the dyes division in Wilmington.

**EASTMAN CHEMICAL PRODUCTS, INC.**, New York, N. Y.–Has reorganized the field-sales activities of the Chemical Div. into three regional areas and has appointed regional sales managers: R. H. Carron, New England and Middle Atlantic states; J. H. Sanders, Cleveland and Cincinnati, Ohio, and Greens-

**THIS MAN HAS REACHED A NEW PEAK.** He has discovered the unsurpassed quality of Torrington Needles. You, too, can discover how these needles can improve your knitting, sewing, felting and tufting operations. Just call

**THE TORRINGTON COMPANY**

*Needle Makers Since 1866*

**Torrington, Conn., U.S.A. • Bedford, P.Q., Canada • Coventry, England**

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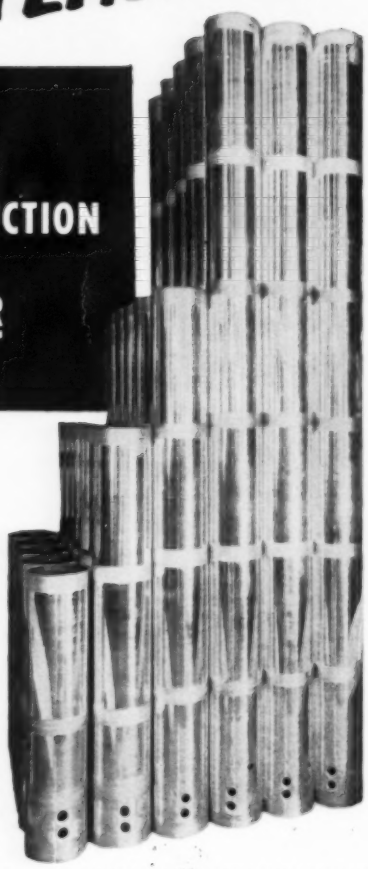
For more data, write this page number on Reader-Service card. →

Gastonia

Dynamically Balanced CYLINDERS

for MORE PRODUCTION at LOWER COST!



Scientifically tested GASTONIA Spinning, Twister, Spooler and Quiller Cylinders are dynamically balanced to assure top performance.

GASTONIA dynamically balanced Cylinders are precision-built for longer use in continuous, high-speed production of cottons, woolens, worsteds, synthetics and asbestos.

For the manufacture, repair or rebuilding of Cylinders to your specifications . . . call GASTONIA.

Years of skilled practical experience are precision-built into all GASTONIA products.

Gastonia TEXTILE SHEET METAL WORKS
Gastonia, North Carolina

*A sheet metal works serving textile mills*

- Condenser screens
- Picker screens
- Waste Machine screens
- Card screens
- Cylinders
- Comber aspirators and dampers

COMBER RENEEDLING
Expert reneedling of combs for cottons, worsteds and synthetics.



boro, N. C. offices, plus other areas of the South and Southeast; D. B. Campbell, Jr., Midwestern area. . . . **FABULIZED, INC.,** Philadelphia, Pa.—Has announced the appointment of six new licensees: Charles H. Bacon Co., Lenoir City and Loudon, Tenn.; Carillon Lingerie Co., New York, N. Y.; Adirondack Finishing Corp., Johnstown, N. Y.; Fox-Wells Tricot Div., New York, N. Y.; E. Schulze & Sons, Reading, Pa.; Lee Dyeing Co. of Canada Ltd., Lachine, Que. . . . **FOOD MACHINERY & CHEMICAL CORP., ORGANIC CHEMICALS DIV.,** New York, N. Y.—Has named B. S. Taylor director of marketing and purchasing.

**HILTON-DAVIS CHEMICAL CO.,** Cincinnati, Ohio—Will build new sales and distribution headquarters in Greenville, S. C. S. Y. Stribling, III, will be in charge. The new building will also house technical service laboratories that will assist textile mills in solving color problems. . . . **HOOKER ELECTRO-CHEMICAL CO.,** Niagara Falls, N. Y.—Has named C. W. Selover manager of purchases for the company's plants at Niagara Falls and North Tonawanda, N. Y. E. W. Mathias has been appointed assistant treasurer and A. W. Chambers, Jr., assistant secretary and associate counsel.

MALCOLM V. MACFARLAN (left) has been named general sales manager for the Rayon Div., American Viscose Corp., Philadelphia, Pa. J. FRANK FORSTER (center) has been appointed president of Vickers, Inc., Detroit, Mich. E. TAYLOR MOBLEY (right) has been appointed manager of the Southern district for Ciba Co., Inc., New York, N. Y.

**JAMES HUNTER MACHINE CO.,** North Adams, Mass.—Has bought, through its subsidiary, Hunter Fiber Machine Co., the equipment and manufacturing rights of Mudrick Machine Works, Los Angeles, Calif. . . . **INDUSTRIAL RAYON CORP.,** Cleveland, Ohio—Has elected E. P. Taylor as treasurer. . . . **INTERNATIONAL LATEX CORP., CHEMICAL DIV.,** New York, N. Y.—Has appointed Latex & Rubber, Inc., Baltimore, Md., sales representative for Tylac latices for New York, New Jersey, Pennsylvania, Maryland, Delaware, and portions of Virginia. . . . **KOPPERS CO., INC.,** Pittsburgh, Pa.—Has appointed G. H. Sollenberger product manager for Super Dylan polyethylene and H. C. Lavely product manager for Dylite expandable polystyrene in the Chemical Div. . . . **McKIERNAN-TERRY CORP.,** Dover, N. J.—Has bought the textile-machinery division of Wiesner-Rapp Co., Inc., Buffalo, N. Y. McKiernan-Terry Corp. has received all textile-machinery patents, engineering drawings, tools, fixtures, inventory, and records.

**MONSANTO CHEMICAL CO.,** St. Louis, Mo.—Has assigned Dr. W. H. Lane, assistant research director of the Plastics Div., to additional duties, including polyethylene research and new administrative functions. S. L. Hunter has been promoted to assistant research director of the Plastics Div.'s research department at Texas City, Tex. . . . **MORNINGSTAR, NICOL, INC.,** New York, N. Y.—Has merged with its principal industrial-adhesives manufacturing subsidiary, Paisley Products, Inc., to form a single corporation, Morningstar-Paisley, Inc. . . . **MOUNT HOPE MACHINERY CO.,** Taunton, Mass.—Is building an addition that will increase shipping facilities, house an enlarged engineering department, and provide additional general office space.

**NASHUA CORP.,** Nashua, N. H.—Has changed its state of

These Stainless Steel package dyeing machines at Berkshire Hathaway are easily cleaned. There is no carry-over of old dyes when colors are changed.

# No contamination with Stainless Steel dye units

## at Hathaway Division, Berkshire Hathaway, Inc.

**Berkshire Hathaway, Inc.** used to send its dye work out to independent contractors. But because of the higher cost of commission dyeing together with shipping expenses and occasional delays, the company finally installed its own dyeing units—and they're all made from Stainless Steel.

Harry C. Jackson, President of Morton Machine Works of Columbus, Georgia, manufacturer of the new equipment, says, "We used Stainless because it's the only metal that can resist the corrosive effects of high-pressure steam, caustic soda, hydrochloric and sulfuric acids, and other agents used in the Berkshire Hathaway dye processes."

With many other metals, complete cleaning is almost impossible. Old dyes and other contaminants adhere to the pitted surfaces, and they kill the sparkle in fresh colors. Tiny chips from corroding tank walls can remain in the equipment and cling to the fibers being dyed.

Mr. Jackson says about Stainless Steel, "Naturally, our engineers give careful consideration to the selection of materials and make thorough follow-up checks. They report excellent results when USS Stainless Steel is specified for a difficult dyeing job."

United States Steel Corporation — Pittsburgh
National Tube — Pittsburgh
American Steel & Wire — Cleveland
Columbia-Geneva Steel — San Francisco
Tennessee Coal and Iron — Fairfield, Alabama
United States Steel Supply — Warehouse Distributors
United States Steel Export Company

USS United States Steel

## Watch lint, oil, smut

**vanish**

## from looms and motors

Oakite "117", the new cold cleaning solvent, is perfect for textile mills. Brush it on or spray it ... blow it off or wipe it — and watch how soils literally vanish from looms, motors, twisters, reed parts and other textile equipment. Especially effective on combinations of lint, grease, oil and smut.

Fast dry-down, high flash point, non-conducting — no wonder so many mill people say Oakite "117" is just what they've been looking for. Write for special Service Report giving details, to Oakite Products, Inc., 26C Rector Street, New York 6, N.Y.

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OAKITE
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BEST FOR MARKING TEXTILES AND FABRICS!
JUNIOR EMPIRE
EMPIRE TEXTILE MILL CRAYON
The result of many years of careful study and experiment to meet the particular requirements of the Textile Industry . . . Available in 18 Colors and in Two Sizes! Write for colorful marking guide. Dept. T-8
THE AMERICAN CRAYON COMPANY
SANDUSKY, OHIO
NEW YORK
EMPIRE TEXTILE MILL CRAYONS
REG. U. S. PAT. OFF.



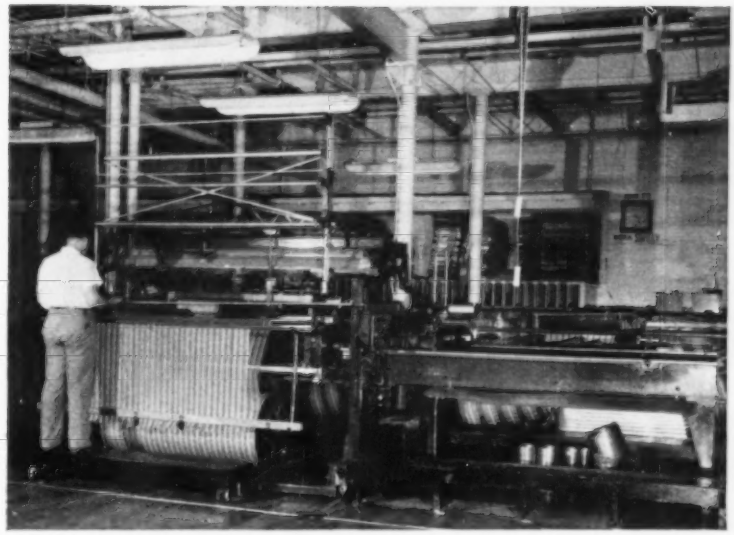

incorporation from Massachusetts to Delaware. J. F. McDermott, Jr., has been promoted to the position of manager of Nashua package-sealing sales. . . . **OLIN MATHIESON CHEMICAL CORP., INDUSTRIAL CHEMICALS, DIV.**, New York, N. Y.—Has established a storage and distribution terminal for liquid caustic soda at Bedford Park, Ill. . . . **PITTSBURGH CORNING CORP.**, Pittsburgh, Pa.—Has appointed W. H. Polk manager of glass-block and Foamglas building-insulation sales in the Philadelphia, Pa., district office.

**PROCTOR & SCHWARTZ, INC.**, Philadelphia, Pa.—Has started building a new plant at Waynesville, N. C. . . . **RELIANCE ELECTRIC & ENGINEERING CO.**, Cleveland, Ohio—Has appointed C. D. Herbert Eastern regional sales manager and E. G. Orahood Southeast regional sales manager. W. K. Schlotterbeck has been named Southwest regional sales manager, and R. O. Herbig has been named Central West regional sales manager. . . . **ROBERTS CO.**, Sanford, N. C.—Has named G. N. Giraudi vice president. He will be director of foreign operations and director of yarn and fabric development. . . . **JOSEPH T. RYERSON & SON, INC.**, Chicago, Ill.—Has appointed R. T. Harvey national product manager. The company also has announced that it is building a warehouse in St. Louis, Mo.

**M. H. CREIGHTON (left) has been named sales manager and North Carolina representative for Jenkins Metal Shops, Inc., Gastonia, N. C. DAVID T. BARRY (center) has been named general sales manager of Stowe-Woodward, Inc., Newton Upper Falls, Mass. C. H. SMITH (right) has been transferred from the Philadelphia, Pa., office to the Minneapolis, Minn., office.**

**SANDOZ, INC., DYESTUFF & CHEMICAL DIV.**, New York, N. Y.—Has appointed Dr. J. W. Luthy director of applications. . . . **SHELL CHEMICAL CORP.**, New York, N. Y.—Has begun shipping hydrogen peroxide from its new plant at Norco, La. . . . **A. E. STALEY MFG. CO.**, Decatur, Ill.—Has appointed R. L. Nagle industrial marketing manager. . . . **STOWE-WOODWARD, INC.**, Newton Upper Falls, Mass.—Has appointed C. E. Hoffman sales service manager of the company's plant at Griffin, Ga. . . . **SUN CHEMICAL CO.**, Long Island City, N. Y.—Has promoted S. Nye to manager of the Southern Textile Application Laboratories of the Warwick Chemical Div.

**TEXTRON INC.**, New York, N. Y.—Has acquired Fanner Mfg. Co., Cleveland, Ohio, in exchange for Textron common stock. . . . **TRUMETER CO.**, New York, N. Y.—Has been appointed sole agent in the U.S. for Drytester G.M.B.H., Lungern, Switzerland. . . . **UNION CARBIDE CHEMICALS CO., DIV. of UNION CARBIDE CORP.**, New York, N. Y.—Has assigned the following technical representatives to district offices: W. C. Friedmann, Houston, Tex.; T. M. Fulton, Los Angeles, Calif.; G. H. Heggland, Cincinnati, Ohio; N. J. Hill, St. Louis, Mo.; J. R. Leusch, Boston, Mass.; J. T. Revell, Newark, N. J. . . . **WARNER & SWASEY CO., TEXTILE MACHINERY DIV.**, Cleveland, Ohio—Has opened a new field sales and service office at Needham, Mass. . . . **WERNER TEXTILE CONSULTANTS**, Larchmont, N. Y.—Has named W. Sizer senior consultant on the marketing staff. . . . **WITCO CHEMICAL CO.**, New York, N. Y.—Has bought Sun Chemical Corp.'s stearate business. . . . **WYANDOTTE CHEMICALS CORP.**, Wyandotte, Mich.—Has placed on stream the first unit for the production of methylpyrazine and 2,5-dimethylpyrazine.



Operator on the Barber-Colman Warp Drawing Machine is here shown drawing a fancy stripe pattern.

At Avondale Mills' Bevelle Plant, Alexander City, Ala., the machine shown here has reduced drawing-in time from 8 hours or more per warp to less than 1½ hours. Most warps at the Bevelle plant range between 4,000 and 6,500 ends. Most cloth styles have 3, 4, or 5 harnesses. Approximately 50 styles are being drawn. Fabrics woven are tickings in plain and fancy stripes, twills, drills, denims, and drapery materials. Fabric constructions range from 65 to 112 ends per inch, average being about 90 ends per inch.

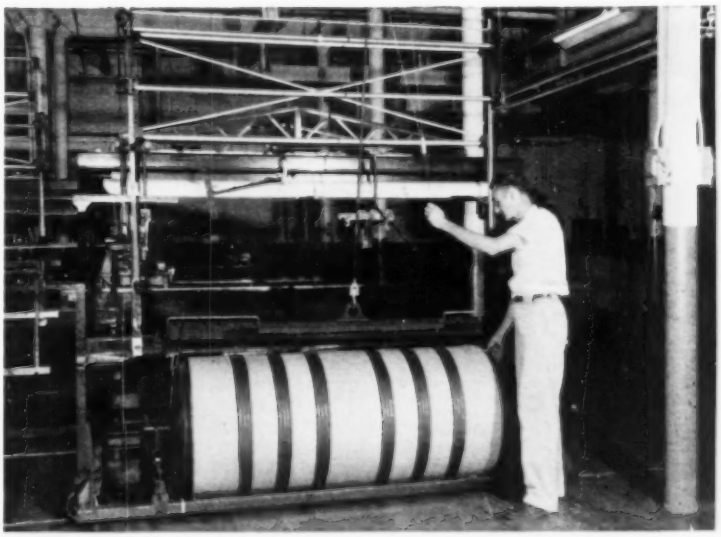
# BARBER-COLMAN

## WARP DRAWING MACHINE

## PAYS FOR ITSELF IN TWO YEARS

In addition to the savings produced by shortened time of warp-drawing, the machine has required less than expected maintenance, and the warps have proved to be of greater accuracy. An operator and two helpers keep the machine and its two trucks going (one truck is loaded while the other is in the machine). The machine shown is a Model 66 GSH, nominally rated for 66" warps, operating at a speed of 140 ends per minute, and capable of drawing 22 harnesses, 6 banks of drop wires, and reed.

Helper in this picture is readying a second warp beam in the truck, which is then rolled up to the machine.



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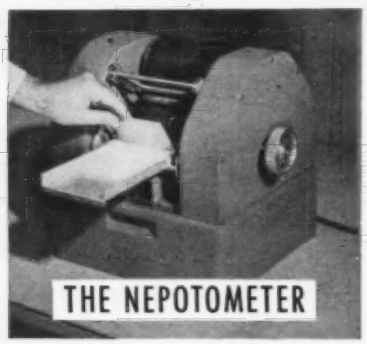
## New Instrument Measures Cotton's Nep Potential




*A 25-grain sample is prepared by hand cards and placed on the feed plate of the Nepotometer. Total time required for test, including stripping, is about six minutes.*

This high precision instrument simulates manufacturing steps. Simply run a sample, compare it with photo standards which come with the instrument, and you know in advance the nep potential. Saves time and money. Permits you to make the most profitable use of your cotton. Literature upon request.

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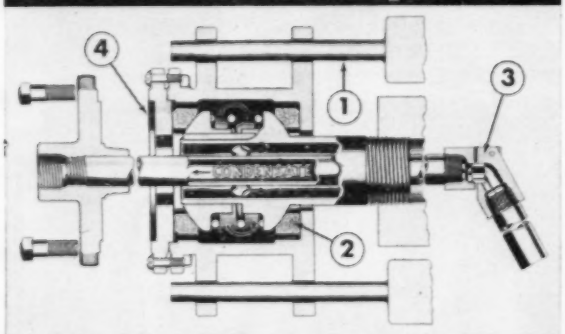


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# NEWS ABOUT MEN

**James D. Anderson** has been promoted to overseer of final inspection at Excelsior Mills, Pendleton, S. C.

**James Bowman,** formerly superintendent of the Flint plant, a unit of Burlington Industries, Inc., East Gastonia, N. C., has been transferred to Greensboro, N. C., on special assignment.

**S. Harris Caldwell** has been named general manager of Berryton Mills, Summerville, Ga. He had been with Henderson Cotton Mills, Henderson, N. C.

**J. Fred Casey** has been named overseer of dyeing at Stamina Mills, Inc., Forestdale, R. I.

**John J. Bradbury** has joined Chester H. Roth Co., New York, N. Y. He had formerly been vice president of Adams-Millis Corp., High Point, N. C.

**W. R. Chandler** has been elected to the board of directors of Clinchfield Mfg. Co., Marion, N. C.

**Robert D. Crowley** has been promoted to vice president in charge of manufacturing at Stedman Mfg. Co., Asheboro, N. C.

**Joseph G. Cucchia** has been named assistant treasurer and assistant secretary of Delaware Mills, Inc., New Castle, Del.

JAMES N. WEEKS is retiring as chairman of the board of Hanes Hosiery Mills Co., Winston-Salem, N. C. He will continue as a director and member of the executive committee.

**R. Fred Daughtery** has been named superintendent of Burlington Industries' Flint plant in East Gastonia, N. C. He had been superintendent of the company's Ranlo plant in Gastonia, N. C.

**James D. Finley** has been elected a vice president of J. P. Stevens & Co., New York, N. Y.

**James R. Fitzpatrick, Jr.,** has been named technical coordinator of products at James Lees & Sons Co., Bridgeport, Pa. He had been director of market research and management development.

**Alfred A. Forster** has been elected chairman of the board

R. B. CRAWFORD (left) has been elected chairman of the board of Hanes Hosiery Mills Co., Winston-Salem, N. C. GORDON HANES (right) has been elected president of the company.

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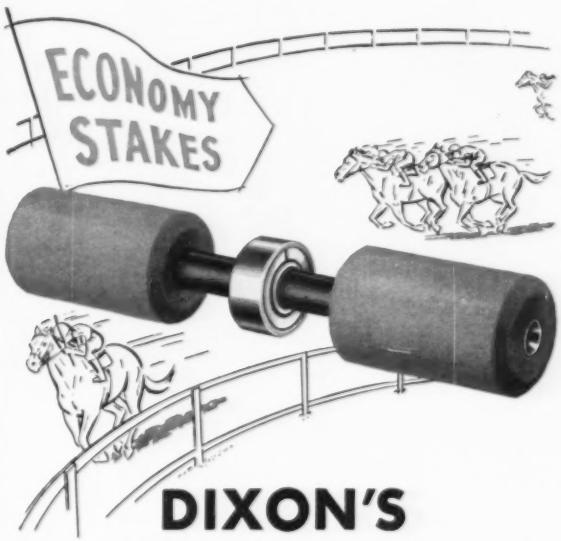


## DIXON'S "Inner Race" Front Roll

Jockeys know the inside rail means greater gain from less distance. For similar reasons, you're sure to win with Dixon's anti-friction front top roll. Only the small diameter inner race turns, requiring far less travel and wear — and *only* Dixon offers this cost-saving advantage. Note these exclusive, unequalled Dixon front roll features:

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5. Unique swivel mounting assures front roll and front saddle self-align automatically.
6. Zero thrust load, due to self-alignment features.
7. Concentricity within .001".
8. Assembled from only 2 major pieces.
9. Simple buffing without attachments.
10. Allows side piecing up.

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Dixon Super Saddle Guides changeovers equipped with the exclusive Dixon rolls eliminate all top roll cap bars and all oiling, can be installed in two steps to spread out investment: Front roll and saddle combination first; later adding middle rolls, back rolls and saddles — no parts wasted, no costly elements to throw away. Dixon Saddle Guide assemblies for more than 1,000,000 spindles (Duo-Roth or Casablanca type spinning) have been supplied to textile leaders like Cone Mills, Columbus Mfg. Co., American & Efird Mills, Inc., Gastonia Combed Yarn Co. and Montreal Cottons, Ltd.

*Write for complete data on Dixon Super Saddle Guide*

723-7

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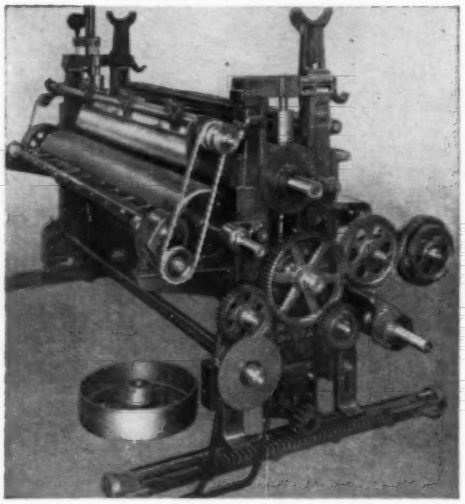

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of Clifton Yarn Mills, Inc., Clifton Heights, Pa.

**Dalton E. Francis** has been appointed director of sales and a member of the board of directors of Stedman Mfg. Co., Asheboro, N. C.

**C. A. Gibson** has been elected to the board of directors of Clinchfield Mfg. Co., Marion, N. C.

**Percy C. Gregory, Jr.**, vice president of Cone Mills Corp., Greensboro, N. C., has taken over the general supervision and responsibility of Carlisle Finishing Co., Carlisle, S. C. He also is in charge of Union Bleachery, Greenville, S. C.

**Andrew E. Grieve** has been named superintendent of finishing at Security Mills, Inc., Newton, Mass.

**Arno F. Haas** has been appointed superintendent of dyeing and finishing at Neisler Mills, Div. of Massachusetts Mohair Plush Co., Inc., Kings Mountain, N. C.

**James L. Hege** has been named vice president in charge of marketing at Stedman Mfg. Co., Asheboro, N. C.

**George Jubrias** has been appointed superintendent of Burlington Industries' Ranlo plant, Gastonia, N. C.

**Carey R. Kinney** has been named president of Elmvale Worsted Co., Elmvale Dye Works, Inc., Pittsfield, Mass.

**Richard G. H. Knight, Jr.**, has joined Neisler Mills, Div. of Massachusetts Mohair Plush Co., Inc., Kings Mountain, N. C., as superintendent of Mayo, Palmetto, Belmont No. 1, and Belmont No. 2 Yarn Mills.

**William R. Kolbus** has been named superintendent of Philadelphia Penn Worsted Co., Philadelphia, Pa.

**J. Colby Lewis** has retired as vice president and head of manufacturing and research of Coats & Clark, Inc., New York, N. Y. He will continue as a consultant to the company.

**Winston L. May, Jr.**, has been named vice president and general manager of the newly formed Professional Products Div., Chicopee Mills, Inc., New York, N. Y. He will continue as vice president and general manager of the Chix Baby Products Div.

**W. Gordon McCabe, Jr.**, has been elected a vice president of J. P. Stevens & Co., Inc., New York, N. Y.

**Edward F. Mulally** has joined Cranston Print Works, Cranston, R. I., as divisional superintendent of printing. He had been assistant manager of Glenlyon Print Works, Phillipsdale, R. I.

**Sydney P. Munroe** has been elected president of Gambrill & Melville Mills Co., Inc., Bessemer City, N. C. He had been vice president and general manager.

**Paul deSaint Phalle** has been elected president of Nicetown Dye Works, Philadelphia, Pa.

**EDWARD A. BERGER** has been named vice president and sales manager of Shelley Knitting Mills, Philadelphia, Pa.

**G. L. VERNON** has retired as superintendent of the Russell Mfg. Co.'s No. 4 mill, Alexander City, Ala.

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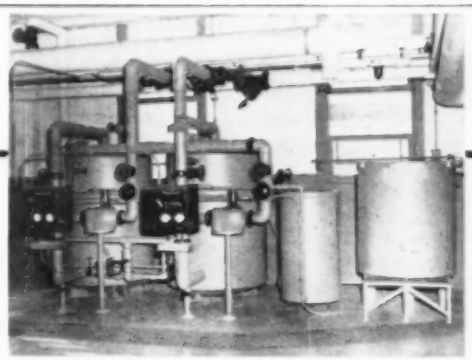

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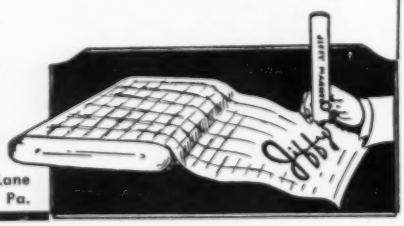

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## NEWS ABOUT MEN Continued

**James D. Ritter** has been named superintendent of the Reeves Bros. mill in Greenville, S. C. He had been superintendent at the company's plant at Chesnee, S. C.

**John L. Sherrill** has been named superintendent of the Pineville plant of Cone Mills Corp., Pineville, N. C.

**John H. Snoddy** has been named to the New York office of Reeves Bros., Inc., New York, N. Y.

**Dennis J. Sweeney** has resigned as overseer of picking at Lobsitz Mills Co., Nutley, N. J

**Robert Walshaw** has been named assistant superintendent at American Felt Co., Franklin, Mass., succeeding W. F. Armstrong.

**John W. Walker** has been appointed assistant general manager of Machias Mill, Inc., Machias, Me. He will continue as plant manager of Kingsley Mill Corp., Thomson, Ga.

STEPHEN P. DEMALLIE has been appointed technical assistant to the president, R. D. Williams, Jr., at Callaway Mills, Inc., New York, N. Y.

**Walter F. Wolfe** has been elected vice president of Indian Head Mills, Inc., New York, N. Y. He is general manager of the company's Franklin Process Div. He had been president of Franklin Process Co., which was purchased by Indian Head Mills.

Textile World

## OBITUARY

**L. Herbert Ballou**, 74, director of The Kendall Co., Walpole, Mass.

**Richard E. Ferguson, Sr.**, 68, former superintendent of Lydia Cotton Mills, Clinton, S. C.

**Christopher L. Grebneaire**, 59, retired vice president of American Thread Co., New York, N. Y.

**Maurice Hendrick**, 71, former president of the Cliffside Div., Cone Mills Corp., Cliffside, N. C.

**Frank David Lockman**, 73, former superintendent of the Deering-Milliken plant at Lockhart, S. C.

**Claude S. Morris**, 88, retired vice president and member of the board of directors of Cone Mills Corp., Greensboro, N. C.

**Joseph N. Paradis**, 76, editor and publisher of *Fibre and Fabrics*, Boston, Mass.

**Nelson C. Poe, Jr.**, 76, former president and treasurer of F. W. Poe Mfg. Co., Greenville, S. C.

**Ralph Rhodes**, 42, vice president of Bigelow-Sanford Carpet Co., Thompsonville, Conn.

**Robert H. Shaner**, 68, president of Perkiomen Knitting Mills, East Greenville, Pa.

**Moses Siegel**, 64, president of Jean Ribbon Mills, Paterson, N. J.

**Henry F. Thomas**, 47, president of Henry F. Thomas, Inc., Forest City, N. C.

**Frank Wineskie**, 83, director of Acclaim Hosiery Mills, High Point, N. C.

## MANAGER
### MONOFILAMENT LABORATORY

Opening for qualified technical person to establish and manage Monofilament Laboratory. Interested person should have at least five years experience in melt extrusion, synthetic fibers, product development, and technical service activities. An excellent opportunity with a basic resin manufacturer having a major stake in the synthetic fiber field. Send a resume of experience, desired salary, etc. to:

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In Application State Age, Education, Experience and Salary Required.

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### *POSITIONS VACANT*

**Plant Engineer or Maintenance Chief with full** knowledge machine tools, electricity and welding. Background in stitching or cloth handling desirable. Plant located 35 miles south of Memphis. P-7299, Textile World.

**Wanted—Tricot Mechanic experienced on 2** and 3 bar pattern work for a well established mill in Mohawk Valley, N. Y. The position is permanent and offers good prospects of advancement. The selected applicant will be reimbursed for moving expenses. In reply state experience and age. Prompt reply essential. P-7173, Textile World.

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**We require a qualified representative with an** established clientele for machine embroidary: macrame, point-lace, nylon, English embroidery, **novelties. Estabi. Maurice LAMOURET.** Villers Outreaux (Nord) France.

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**F. F. Hosiery Machine—Erector—Fixer exp.** all types reading machines inc. latest automatics—locate anywhere. PW-7328, Textile World.

**French Textile Engineer, Age 35, exceptional** scientific education, 8 years experience in mills managing, seeks broader opportunity in Canada or South Africa. PW-7209, Textile World.

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50—Draper Model XD 46" Automatic Looms, 53" Reed Space, 40 Harness Dobby, Diehl Drives.
300—Draper Model X 40" Automatic Looms, 45½" Reed Space, 5 Harness, 500/3/60 Motors.
100—Draper Model K 40" Automatic Loom, 45½" Reed Space, 20 Harness Dobby Head, 550/3/60 Motors.
4—Saco-Lowell Spinning Frames, Z-2 Drafting System, 4" gauge, 2½" Ring, 8½" Traverse, "V" Belt Drive, 10 HP Motor.
2—Abbott Model 65 Cone Winders, Automatic Heads, Conveyor Bobbin Box and Hoist, 550/3/60 Motors, for Wood Cones.
14—Universal Winding "Atwood" Model, 100 Uptwisters, 200 Spindles each, double deck, 2—5 HP 550/3/60 Motors per frame, year 1948.
5—Universal Winding "Atwood" 68 Spindle Re-draw Machine, 8½" gauge, 3 box tension, Model 200, 1 HP 550/3/60 Motor, year 1948.
3—Johnson 7 SS Cylinder Cotton and Rayon Slashers.
5—Cocker High Speed 54" Rayon Warpers with 600 End Magazine Creels.
3—"H-W" Conditioners, Type RT-2, Year 1948.
1—Titan Warp Tying-in machine, Model GK-6B, Serial #1090, Year 1956, 110/1/60 electrical characteristics, with 1—stand 60" Model GS 215.
4—Barber Colman Portable Warp Tying-in Machines, Models LC and LS, manual and motor operated units.
4—Kidde 6-Bar Rachell Machines, Model C.
2—Kidde 8-Bar Rachell Machines, Model C.
1—Wiesner-Rapp Continuous Bleaching Range, Becco Type.
1—National Loop Dryer, 40' long, 7'4" wide, #390127A, individual blowers and motors.
1—50" Van Vlaanderen 3 Roll Hydraulic Calendar, 80 Ton capacity; top roll gas heated, middle roll wool-paper; bottom roll steam heated. With Seam Detector.
1—57" Textile Machinery Company Simplex Compressive Shrinking Machine.
1—Morrison Duplex Compressive Shrink Machine.
1—66" x 120' Van Vlaanderen Clip Tenter with National Housing and Pre-Dryer, D/C Variable Speed Drive, 1950.
1—James Hunter 9 Bowl High Speed Continuous Cloth Washer, each bowl complete with 90" pneumatic rubber covered rolls.
1—40" Wamesit, Model J, Spool Warper for winding on stainless steel perforated dye beams, year 1953.
1—72" David Gessmer, Semi-Decator.

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**PACKAGE DYEING MACHINE**
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**1 500 lb. unit with winding and coning equipment, suitable for cotton yarns. Send full details to**

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26—Stainless Steel Enclosed Dye Boxes, 6 x 12′ wide
6—V. V. Duplex Stainless Dye Boxes, 12x8′
1—V. V. Finishing Range, 100′ x 64″—1951
1—V. V. Finishing Range, 90′ x 62″—1946
1—Textile Open Washer, 60″, 4 pneu. squeezes
3—R. B. & F. Print Machines; 3 color—64″, 8 color—64″, 12 color—52″, complete w/backrigging
4—Mulhouse Print Machines; 10 color—63″, 3—12 color—63″

### St. Croix Mill, Milltown, New Brunswick

3—Aldrich Single Process Pickers, 40″, 2 beaters—1950
20—Whitin 12 Draw. Frames, 4 del.—1947
9—Whitin G8, 8 x 4 Roving Frames, 138 spdl.—1947
2—Whitin G10, 10 x 5 Roving Frames, 120 spdl.—1953
20—Whitin F2 Spinning, 4″ ga. Long Draft, 240 spdl.—1947
3—Abbott Cone Winders #65, 2—135 spdl. 1—130 spdl.—1954
4—Abbott Quill Winders, 100 spdl. pin board—1953
68—C. & K. Model C4 Looms, 78″ swords, 4 x 1,—1949
1—Dalglish 100′ x 72″ Finishing Range, complete—1949

### Grandmere, Quebec—Surplus Woolen Machinery

42—C. & K. Model W3 Woolen Looms, 82″, 1946-49
30 spdls.—Whitin Schweiter Quillers, MS—1944
1—Hunter Pneumatic Padders, 80″, 12 ton—1951
6—Stainless Enclosed Dye Boxes, 4 x 12′, 1947-51
1—Arlington Scutcher 80″, Vacuum Extractor L4, Detwister
1—Windle Cloth Doubler 82″ wide—1951
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4—60" S. A. C. M. Worsted Cards with Automatic Feeders, Belt Driven.
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5—Foster Model 102 Cone Winders, 100 Spindles each, 7" Traverse, Individually Motor Driven, Late Model Machines.
5—Foster Model 102 Cone Winders, 70 Spindles each, 7" Traverse, Individually Motor Driven, Late Model Machines.
3—Foster Model 102 Cone Winders, 100 Spindles each, 6" Traverse, Individually Motor Driven, Late Model Machines.
2—Foster Model 102 Cone Winders, 60 Spindles each, Individually Motor Driven, Late Model Machines.
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240—Spindles Whitin Schweiter Automatic Filling Winders Arranged in 15 Spindle Sections, 4 Sections to each Machine, 4 Machines in all, 1944-42 Model, Motor Driven.
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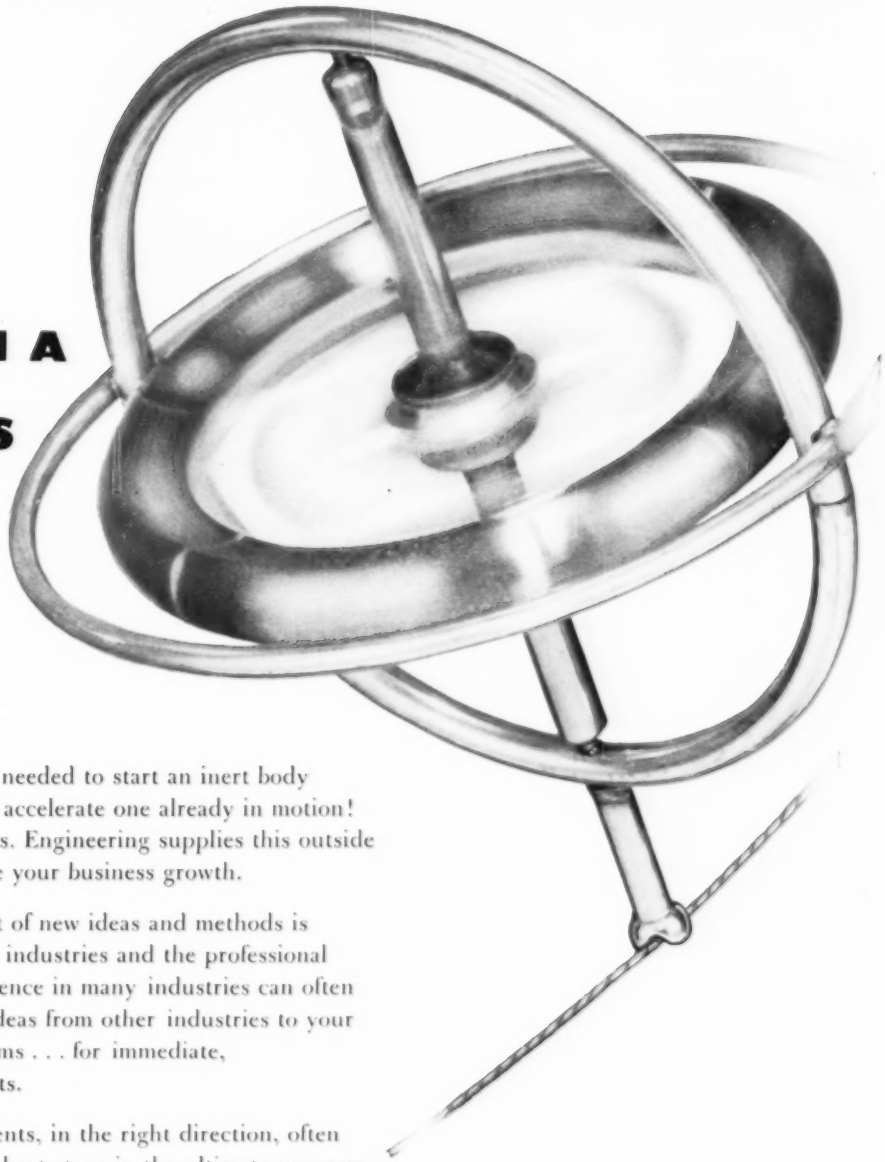

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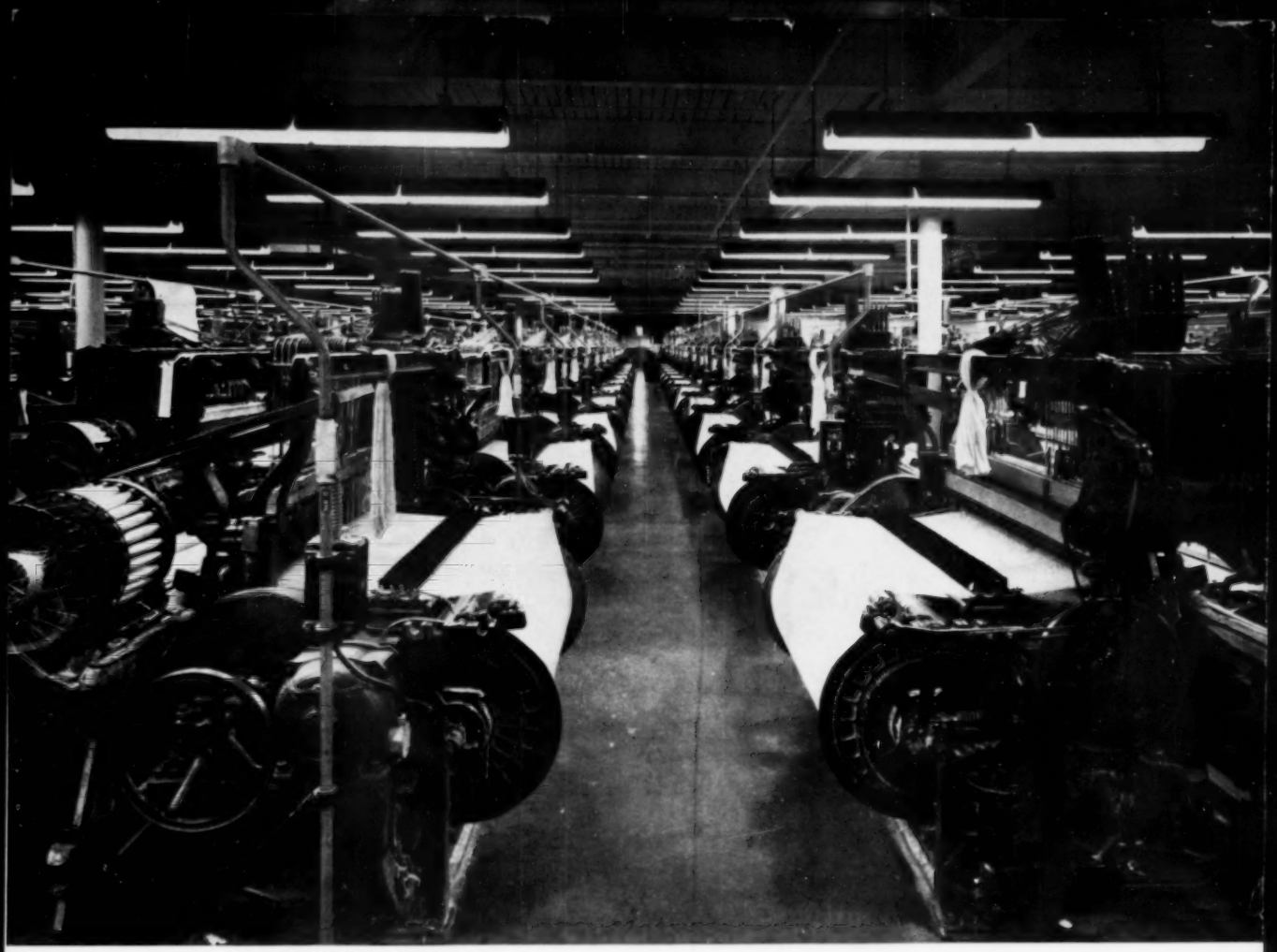

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